

EXHIBIT G

Exhibit G – SEALED excerpts of Plaintiffs’ Expert Witness K. Keyes
Transcript of Deposition (Sept. 15, 2020)

PLAINTIFFS’ OPPOSITION TO DEFENDANTS’ MOTION TO EXCLUDE MARKETING
OPINIONS OF DRS. ANNA LEMBKE, KATHERINE KEYES, ANDREW KOLODNY, AND JAKKI
MOHR

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA

* * * * *

THE CITY OF HUNTINGTON,

Plaintiff,

vs.

CIVIL ACTION
NO. 3:17-01362

AMERISOURCEBERGEN DRUG
CORPORATION, et al.,
Defendants.

CABELL COUNTY COMMISSION,
Plaintiff,

vs.

CIVIL ACTION
NO. 3:17-01665

AMERISOURCEBERGEN DRUG
CORPORATION, et al.,

Defendants.

* * * * *

Videotaped and videoconference deposition
of KATHERINE KEYES taken by the Defendants under
the Federal Rules of Civil Procedure in the above-
entitled action, pursuant to notice, before Teresa
S. Evans, a Registered Merit Reporter, all parties
located remotely, on the 15th day of September,
2020.

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EXAMINATION INDEX

BY MR. HESTER	9
BY MR. METZ	304

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

EXHIBIT INDEX

			MAR
Exhibit 2	Expert Report of Katherine Keyes, PhD dated August 3, 2020		10
Exhibit 4	CDC Guideline for Prescribing Opioids for Chronic Pain - United States, 2016		134
Exhibit 9	"Opioid Abuse in Chronic Pain - Misconceptions and Mitigation Strategies" by Volkow and McLellan dated 3-31-16		102
Exhibit 10	"The Role of Opioid Prescription in Incident Opioid Abuse and Dependence Among Individuals With Chronic Noncancer Pain" by Edlund, et al. dated July 2014		47
Exhibit 18	"Rates of opioid misuse, abuse, and addiction in chronic pain: A systematic review and data synthesis" by Vowles, et al. dated April 2015		20
Exhibit 27	"Increased use of heroin as an initiating opioid of abuse" by Cicero, et al. dated 2017		217
Exhibit 28	"Relationship between Nonmedical Prescription-Opioid Use and Heroin Use" by Compton, et al. dated 1-14-16		223
Exhibit 34	"Association of Nonmedical Pain Reliever Use and Initiation of Heroin Use in the United States" by Muhuri, et al. dated August 2013		209

EXHIBIT INDEX (Contd.)

Exhibit 37	"Psychoactive substance use prior to the development of iatrogenic opioid abuse: A descriptive analysis of treatment-seeking opioid abusers" by Cicero, et al. dated 2017	208
Exhibit 46	"A prospective study of nonmedical use of prescription opioids during adolescence and subsequent use disorder symptoms in early midlife" by McCabe, et al. dated 1-1-19	99
Exhibit 86	"Underlying Factors in Drug Overdose Deaths" by Dowell, et al. dated 12-19-17	324
Exhibit 96	"The Comparative Safety of Analgesics in Older Adults With Arthritis" by Solomon, et al. dated Dec. 13/27, 2010	287
Exhibit 98	"The Prescription Opioid and Heroin Crisis: A Public Health Approach to an Epidemic of Addition" by Kolodny, et al. dated 1-12-15	38
Exhibit 104	"Opioids - CT2 (WV) - Dr. Katherine Keyes Expert Report, Errata Sheet (August 24, 2020)	12
Exhibit 106	"Understanding the Rural-Urban Differences in Nonmedical Prescription Opioid Use and Abuse in the United States" by Keyes, et al. dated February 2014	41

EXHIBIT INDEX (Contd.)

Exhibit 108 "Prescription opioid use 288
disorder and heroin use among
youth nonmedical prescription
opioid users from 2002 to 2014"
by Martins, et al. dated 2-1-18

1 P R O C E E D I N G S

2 VIDEO OPERATOR: Good morning. We are
3 going on the record at 8:59 a.m. on September the
4 15th, 2020. Please note that microphones are
5 sensitive and may pick up whispering, private
6 conversations and cellular interference. Please
7 turn off all cell phones or place them away from
8 the microphones as they can interfere with the
9 deposition audio.

10 Audio and video recording will continue
11 to take place unless all parties agree to go off
12 the record. This is Media Unit 1 of the video
13 recorded deposition of Katherine Keyes taken by
14 counsel for the defendant in the matter of City of
15 Huntington and Cabell County Commission versus
16 AmerisourceBergen Drug Corporation, et al, filed in
17 the United States District Court for the Southern
18 District of West Virginia, being Civil Action Nos.
19 3:17-01362 and 3:17-01665.

20 This deposition is being conducted
21 remotely via Zoom conferencing. My name is Adam
22 Hager from the firm Veritext, and I'm the
23 videographer. The court reporter is Teresa Evans
24 from the firm Veritext.

1 I'm not authorized to administer an
2 oath; I am not related to any party in this action;
3 nor am I financially interested in the outcome.

4 Counsel and all present in the room and
5 everyone attending remotely will now state their
6 appearances and affiliations for the record.

7 If there are any objections to
8 proceeding, please state them at the time of your
9 appearance, beginning with the noticing attorney.

10 MR. HESTER: This is Tim Hester,
11 counsel for Defendant McKesson of the law firm of
12 Covington & Burling, and with me on the video is my
13 colleague, Stephen Petkis.

14 MR. ARBITBLIT: This is Don Arbitblit
15 with Paulina do Amaral and Britt Cibulka, Lief
16 Cabraser Heiman & Bernstein, for the Plaintiffs.

17 MS. CAMPBELL: Molly Campbell from
18 Reed Smith on behalf of AmerisourceBergen.

19 MR. METZ: Carl Metz, Williams &
20 Connolly, on behalf of Cardinal Health.

21 MS. SMITH: Christina Smith, Powell &
22 Majestro, on behalf of the Plaintiffs.

23 VIDEO OPERATOR: If there are no
24 further appearances to be noted, would the court

1 reporter please swear the witness.

2 (The witness was sworn.)

3 K A T H E R I N E K E Y E S

4 was called as a witness by the Defendant, and
5 having been first duly sworn, testified as follows:

6 EXAMINATION

7 BY MR. HESTER:

8 Q. Good morning, Doctor Keyes. My name is Tim
9 Hester, and I'll be taking your deposition today.
10 Since this is a Zoom deposition, let me just begin
11 by setting the stage. Where are you right now?

12 A. I am in the law offices of Lieff Cabraser
13 in New York.

14 Q. Is there anyone else with you in the room?

15 A. Yes.

16 Q. Who else is with you in the room?

17 A. Paulina do Amaral.

18 Q. And do you have a box that we -- that we
19 sent to you? Is that box there somewhere in the
20 room with you?

21 A. Yes.

22 Q. And are there any other papers that you're
23 going to be consulting aside from papers that we'll
24 ask you to open up out of that box?

1 A. No.

2 Q. Okay. Let me ask you, if you could, open
3 up the box and let's have you pull out Exhibit 2,
4 please.

5 KEYES DEPOSITION EXHIBIT NO. 2

6 (Expert Report of Katherine Keyes, PhD
7 dated August 3, 2020 was marked for
8 identification purposes as Keyes
9 Deposition Exhibit No. 2.)

10 A. And I should open it?

11 Q. Yes. Yes. Sorry for these mechanics --

12 A. Quite all right.

13 Q. -- but yes. Doctor Keyes, do you recognize
14 Exhibit 2?

15 A. I do.

16 Q. And this is the report you submitted in
17 this litigation; is that correct?

18 A. Yes.

19 Q. And you're stating the opinions that are
20 set forth in that report?

21 A. I am.

22 Q. Are you stating any opinions in this
23 litigation that are not set out in the report?

24 A. No.

1 Q. And I understand that you are relying on
2 the studies and the facts that you specifically
3 cite in the report; is that correct?

4 A. Yes.

5 Q. Are there any other specific studies or
6 specific facts that you are relying on to support
7 your opinions that are not stated in the report?

8 A. Not specifically. I mean, I have
9 considered other materials since the report has
10 been submitted, so to the extent that there are new
11 materials on the Materials Considered list, I may
12 use those as well.

13 Q. Are you relying on any of these other
14 materials that you've reviewed since you submitted
15 your report to support your opinions?

16 A. The materials I've considered support my
17 opinions, and so to the extent that I have
18 considered them since submitting the report, I -- I
19 rely on them.

20 Q. What materials are you referring to?

21 A. I believe there is a Supplemental Materials
22 Considered List that has been submitted.

23 Q. Yes, and we've seen that. So we've seen
24 the Supplemental Materials List. Is there anything

1 else aside from what's listed in those supplemental
2 materials that you are relying on to support your
3 opinions?

4 A. No.

5 Q. Could you open up Exhibit 104, please?

6 KEYES DEPOSITION EXHIBIT NO. 104

7 ("Opioids - CT2 (WV) - Dr. Katherine
8 Keyes Expert Report, Errata Sheet
9 (August 24, 2020) was marked for
10 identification purposes as Keyes
11 Deposition Exhibit No. 104.)

12 A. I have something that says "Exhibit 1."

13 Q. Yeah, Exhibit 1 is not very interesting.
14 It's just the notice of your deposition. We
15 probably don't need to spend time with it.

16 A. Oh, Exhibit 104 as in --

17 Q. 104.

18 A. Okay.

19 Q. Yeah. There's no real logic to the
20 numbering, I'll tell you that.

21 A. Okay. Good to know. It's going to take me
22 a minute.

23 MS. DO AMARAL: Mr. Hess, is Exhibit
24 104 one of the exhibits that you sent to us

1 electronically last night?

2 MR. HESTER: Oh, sorry. Yes, it may
3 well be. It's the report errata that we received
4 from Doctor Keyes.

5 A. I have it.

6 Q. Is it in there, Doctor Keyes?

7 A. It is.

8 Q. Okay, great. Could you open that one up?
9 And these are the errata that you submitted with
10 respect to your report; is that correct?

11 A. Yes.

12 Q. And just for the record, this is marked as
13 Exhibit 104. Are these changes, Doctor Keyes, that
14 you discovered after you submitted your report?

15 A. Yes.

16 Q. How did you discover them?

17 MR. ARBITBLIT: Time out. Tim, I'm
18 just going to instruct the witness that she cannot
19 -- I'll instruct her not to answer about any
20 discussions with counsel which are confidential and
21 privileged.

22 Q. Well, what I wanted to ask, Doctor Keyes,
23 is: Did you discover them upon your review of the
24 report? Did you see some errors that needed to be

1 corrected?

2 A. Yes.

3 Q. And do you have any other corrections to
4 your report aside from those that are reflected in
5 Exhibit 104?

6 A. Not at this time.

7 Q. Doctor Keyes, I wanted to ask what your
8 hourly rate is for your testimony in this matter?

9 A. \$550 per hour.

10 Q. And is there any different rate that you're
11 paid for testifying either in a deposition or at
12 trial?

13 A. That is my rate for testimony, \$550.

14 Q. So it's your rate for all your work in the
15 case?

16 A. No, for preparation, I charge \$400 per
17 hour.

18 Q. And do you know -- and I take it you have
19 testified now in the opioid litigation in Ohio and
20 in New York and now this litigation in West
21 Virginia. Correct?

22 A. Yes.

23 Q. Do you know roughly how much you've been
24 paid in total for all of your work in these opioid

1 litigation matters?

2 A. Yes. Roughly \$175 --

3 MR. ARBITBLIT: Time out. Tim, I
4 don't want to interrupt your flow. I just want to
5 mention that there's been back and forth which I
6 don't know whether you're following the back and
7 forth about billing. I understand from seeing back
8 and forth -- this is what I saw that the two sides
9 agreed to. Neither side produces invoices, provide
10 hourly rate, number of hours and amount billed in
11 this case, not overall opioid litigation billing.

12 Is that your understanding? Or do you
13 have a different understanding?

14 MR. HESTER: I haven't really been
15 following the back and forth, Don. I -- it's just
16 one question I wanted to ask which seems like a
17 legitimate question, which is: How much has Doctor
18 Keyes been paid for her work in all the opioid
19 litigation?

20 MR. ARBITBLIT: Tim, I agree that it's
21 a legitimate question. However, if it's going to
22 be legitimate on one side, it has to be legitimate
23 on both sides, and from what I've seen -- I'm happy
24 to have her answer the questions that I just read

1 to you that I've seen agreed and leave it for later
2 in the deposition if you want to consult with your
3 team and have a basis to add to what's been agreed.

4 I don't -- I'm not trying to be an
5 obstructionist; I'm just trying to be the team
6 player that follows the rules that my team and your
7 team seem to have agreed on.

8 MR. HESTER: All right.

9 Q. Well, Doctor Keyes, how much have you been
10 paid to date for your work in this West Virginia
11 litigation?

12 A. And I apologize. Just before answering --
13 I have a technical problem, which is that I lost
14 the realtime, so --

15 Q. Okay. Can you --

16 A. Yeah. I can answer while that's being
17 pulled up. I just wanted to --

18 Q. All right. Okay.

19 A. So --

20 Q. Do you know how much you've been paid to
21 date for your work testifying in this West Virginia
22 litigation?

23 A. In the West Virginia litigation?

24 Q. Yes.

1 A. I have been paid approximately \$60,000, I
2 believe.

3 Q. And that reflects -- is that the reflection
4 of the hours you've worked thus far in the West
5 Virginia litigation? In other words, the payments
6 are up to date?

7 A. I -- what do you -- by "up to date," you
8 mean like as of yesterday or --

9 Q. Well, when you said you've been --

10 A. That's how much I've invoiced.

11 Q. Excuse me?

12 A. I'm sorry, that's how much I've invoiced.

13 Q. Okay. All right. Thank you.

14 I -- do you have any stake in the
15 outcome of the litigation? In other words, do you
16 receive any bonus or extra payment depending on the
17 outcome?

18 A. No.

19 Q. Let me ask you, Doctor Keyes, just a few
20 background questions so we have a common
21 understanding here. You understand that the
22 defendants in this West Virginia litigation are
23 distributors of controlled substances, including
24 prescription opioids, right?

1 A. Yes.

2 Q. And they're licensed by the federal and
3 state government to distribute those opioids; is
4 that right?

5 A. Yes.

6 Q. And do you also understand that these
7 distributors distribute a wide range of other
8 medical products in addition to prescription
9 opioids?

10 A. Yes.

11 Q. Do you understand that these distributors
12 buy prescription opioids from drug manufacturers
13 and then sell them to pharmacies?

14 A. Yes.

15 Q. And you understand that the pharmacies then
16 dispense prescription opioids to patients based on
17 prescriptions written by doctors; is that right?

18 A. That's right.

19 Q. And do you have any knowledge of the
20 customers served by these three distributors?

21 A. I have general knowledge about kind of
22 different pharmacy chains and different pharmacies
23 that would be served by the distributors. But it's
24 not my specific area of expertise.

1 Q. So your general knowledge is that they --
2 is that they deal with pharmacies, both chains and
3 smaller pharmacies?

4 A. That's my general knowledge, yes.

5 Q. Do you have any knowledge of their market
6 shares?

7 A. I don't.

8 Q. Do you have any knowledge in relation to
9 their operations specifically in Cabell County and
10 Huntington?

11 A. No.

12 Q. And I take it that your opinions are not
13 dependent on knowledge of these distributors'
14 operations in Cabell and Huntington. That's not
15 something that you studied for purposes of your
16 opinions?

17 A. The -- I have opinions that include the
18 distribution of opioids in Cabell County. So to
19 the extent that the distributors distributed in
20 Cabell County, that is included in my opinions.

21 Q. But you haven't undertaken to develop any
22 knowledge about their operations in Cabell County
23 for purposes of providing your opinions, correct?

24 MR. ARBITBLIT: Objection.

1 A. I -- perhaps you could clarify what you
2 mean by "operations."

3 Q. Well, you didn't -- you didn't study what
4 -- what their market shares or distribution
5 patterns are in Cabell and Huntington, did you?

6 A. I studied the distribution patterns of
7 opioid distribution in Cabell. I did not study
8 market shares.

9 Q. What did you study about distribution
10 patterns?

11 A. The amount of opioids that are distributed
12 in the counties.

13 Q. In the aggregate by these three
14 distributors and others? That's what you were
15 looking at, is the aggregate distribution?

16 A. That's -- that's correct.

17 Q. Let me ask you to pull out Exhibit 18,
18 please.

19 KEYES DEPOSITION EXHIBIT NO. 18

20 ("Rates of opioid misuse, abuse, and
21 addiction in chronic pain: A
22 systematic review and data synthesis"
23 by Vowles, et al. dated April 2015 was
24 marked for identification purposes as

1 Keyes Deposition Exhibit No. 18.)

2 Q. And for the record, Exhibit 18 is a
3 document written by Kevin Vowles and others
4 entitled "Rates of opioid misuse, abuse and
5 addiction in chronic pain: a systematic review and
6 data synthesis."

7 Doctor Keyes, I take it you're familiar
8 with this document?

9 A. I am.

10 Q. And you cite -- you cite this report, or
11 this document, in your report. Is that correct?

12 A. Yes.

13 Q. Well, let me ask you if you could turn to
14 your report. I think if we go to page 17 of your
15 report, Exhibit 2.

16 MR. ARBITBLIT: Counsel, before you
17 ask your next question, I just want to interpose an
18 objection based on Rule 26 that this deposition
19 should not be duplicative of past depositions, and
20 in particular, the Court must limit the frequency
21 or extent of discovery otherwise allowed by these
22 rules if it determines that the discovery sought is
23 unreasonably cumulative or duplicative, and the
24 Vowles study has been the subject of prior

1 questioning and opportunity to question thoroughly
2 at previous depositions of this witness.

3 I will allow the question, but we'll
4 see where it goes, and if it is going to be
5 redundant or duplicative, then I will object and
6 we'll have to address that.

7 MR. HESTER: Well, we don't need to
8 spend time on that right now. I mean, I would just
9 say that she's -- Doctor Keyes has submitted a new
10 report in the -- in the West Virginia litigation,
11 and I'm asking her about the contents of her report
12 as submitted in West Virginia.

13 So I think --

14 MR. ARBITBLIT: I understand that. I
15 understand that.

16 MR. HESTER: I think it's fair play.
17 But I'm not going to -- I'm not going back over --
18 my plan is not to go back over ground that's been
19 covered before. My plan is to focus on questions
20 that relate to the expert report Doctor Keyes
21 submitted in this case.

22 MR. ARBITBLIT: I understand that's
23 the plan, and I appreciate your position. I would
24 just say that the Vowles article does not deal

1 specifically with West Virginia, and to the extent
2 that it has been the subject of prior discussion,
3 if you have something new to ask about it that
4 hasn't been covered or the opportunity for it
5 hasn't been covered, that would not be duplicative.

6 MR. HESTER: Well, you are right --
7 you are right that you're interfering with the
8 deposition.

9 Let's keep going, and we'll come back
10 to it if we need to.

11 MR. ARBITBLIT: I did not say that I
12 am interfering with the deposition, Counselor, and
13 I am not.

14 MR. HESTER: So you are. Let's --
15 let's keep going. I understand your position.
16 Let's keep going.

17 BY MR. HESTER:

18 Q. Doctor Keyes, you cite the Vowles study at
19 page 17 of your report. That's the basis for this
20 chart that you submitted; is that correct?

21 A. That's correct.

22 Q. And --

23 A. I'm sorry, can I correct that? I'm sorry.
24 Can you repeat the question?

1 Q. Yes. Is the -- is the chart at Exhibit 17
2 of your report, that's the source for the -- the
3 Vowles study is the source for that chart.
4 Correct?

5 A. It is one source. I've also corroborated
6 the numbers in Figure 1 with other sources as well.

7 Q. But the numbers you cite in that chart are
8 from the Vowles study?

9 A. That's one study that has this range of
10 numbers.

11 Q. But the numbers you pulled out are taken
12 out of the document -- out of the Vowles document;
13 is that right?

14 A. That's correct. I just want to -- to amend
15 my -- the answer to acknowledge that it's not just
16 the one study that reports this range of numbers.

17 Q. And -- and your reliance on Vowles is based
18 on your review of the literature; is that correct?

19 A. Yes.

20 Q. And you have not undertaken any studies
21 yourself. You reviewed other studies in the
22 literature to decide that you would rely on Vowles.
23 Is that right?

24 A. I have -- I have undertaken studies of

1 opioid use disorder myself. So --

2 Q. But for purposes of what you've set out in
3 your report here, it's based on a review of
4 literature. Is that right? At pages 16 and 17 of
5 the report, it's based on a review of literature?

6 A. Yes. Page 16 and 17 is based on a review
7 of the literature.

8 Q. And am I right that the Vowles paper is
9 focused solely on chronic noncancer pain treatment?

10 A. The inclusion criteria for studies in the
11 -- in the Vowles review is chronic pain. So --

12 Q. And --

13 A. -- it could have other conditions as well,
14 but the focus is chronic pain.

15 Q. Right. So patients who are taking opioids
16 for chronic pain, noncancer chronic pain, that was
17 the inclusion criteria for the Vowles study?

18 A. That's correct.

19 Q. And are you aware that there are other uses
20 for opioids, other medical uses, for opioids aside
21 from chronic noncancer pain?

22 A. Yes, I am.

23 Q. And I take it that prescription opioids
24 have a legitimate medical use for the treatment of

1 acute pain and acute injury. Do you agree with
2 that?

3 MR. ARBITBLIT: Objection.

4 A. I wouldn't make a blanket statement about
5 the legitimate medical use of opioids, no.

6 Q. Do you have knowledge about the legitimate
7 medical use of opioids?

8 A. Yes.

9 Q. And what's your knowledge about the
10 legitimate medical use of opioids?

11 A. I rely on -- the literature that I cite in
12 this report indicates that, in general, the use of
13 opioids for pain relief is -- should be limited and
14 -- to, you know, certain conditions. I don't think
15 "legitimate use" is a blanket term that I would
16 use.

17 Q. Do you have any knowledge of the legitimate
18 medical uses for opioids? Do you have knowledge of
19 that?

20 MR. ARBITBLIT: Objection.

21 A. Yes.

22 Q. And what's -- and -- what -- can you
23 describe for me a legitimate medical use of a
24 prescription opioid?

1 MR. ARBITBLIT: Objection.

2 A. Not as a -- not as a blanket statement, no.

3 Q. Let me ask you to --

4 A. It's a case-by-case basis.

5 Q. Let me ask you to look at Exhibit 106,
6 please.

7 MR. ARBITBLIT: Are those the
8 supplement --

9 MR. HESTER: Those may be the ones we
10 sent overnight. Sorry.

11 Q. Doctor Keyes, let me ask you -- on the ones
12 we --

13 MR. HESTER: We sent several studies
14 that we were going to use today -- or documents
15 that we were going to use today by e-mail. Did you
16 have a chance to print those out or -- ?

17 MS. DO AMARAL: We did -- we did have
18 a chance -- I'm sorry.

19 MR. HESTER: Sorry, Paulina, there's
20 feedback.

21 MS. DO AMARAL: We did have a chance
22 to print them out. We haven't had a chance to
23 collate them. We had some difficulties with the
24 connection this morning, but I have them here. It

1 will take just a moment to get my hand on that.

2 MR. HESTER: Okay. And what I wanted
3 to show to Doctor Keyes is Exhibit 106.

4 BY MR. HESTER:

5 Q. While we're doing that, just one more
6 threshold question, Doctor Keyes: I take it that
7 Vowles itself is a review of other studies in the
8 literature; is that right?

9 A. That's correct.

10 MS. DO AMARAL: Counsel, we need a
11 couple minutes. It might make sense to move --

12 MR. HESTER: Okay, all right, so it
13 will take you a little bit. I'll circle back to
14 that.

15 Q. Doctor Keyes, we spoke a minute ago about
16 the fact that the Vowles study is focused on
17 chronic use of opioids; is that right?

18 A. I think there is information on the range
19 of duration. I don't mean to hesitate; it's just I
20 don't know that -- I don't know -- I guess, what do
21 you mean by "chronic use"?

22 Q. Well, we spoke before that the criteria for
23 inclusion of studies in this survey was treatment
24 of chronic noncancer pain. Correct?

1 A. That's correct.

2 Q. And I just wanted to ask you then: What's
3 your understanding of the word "chronic"?

4 A. I'm trying to see what -- I don't believe
5 that there's a definition in terms of -- aah.

6 "Persistent pain lasting longer than three months"
7 is the definition that's used in this.

8 Q. And the --

9 A. The inclusion criteria did not include that
10 the opioids were used for longer than three months,
11 for example.

12 Q. That was my question, whether this -- the
13 inclusion criteria were people with chronic pain or
14 people who used opioids chronically?

15 A. In terms of the inclusion criteria, I think
16 the focus was on people with chronic pain.

17 Q. Do -- let me ask you to look at page 16 of
18 your report, please. Do you have it there?

19 A. Yes.

20 Q. And in the middle of the full paragraph on
21 that page, there's a sentence almost exactly
22 halfway through. It says, "Individuals in the
23 study had been using opioids for an average of 5"
24 to "six years."

1 Do you see that?

2 A. Just give me a moment.

3 Q. It's about halfway through your paragraph.

4 A. So that's referring to the Jamison, et al
5 study, 2010.

6 Q. Oh, that's a reference to Jamison, et al;
7 it's not a reference to Vowles?

8 A. That's correct.

9 Q. Do you know -- do you know the average use
10 of use -- sorry.

11 MR. HESTER: Let me strike that.

12 Q. Do you know the average period of use in
13 the studies that are covered by the Vowles study?

14 A. No, not -- not off the top of my head.

15 Q. Do you --

16 A. Sorry.

17 Q. I take it also -- let me ask you about
18 dosing levels. You're familiar with this concept
19 of dosing levels; is that correct?

20 A. I am.

21 Q. And dosing levels refers to the -- to the
22 level of dose of a prescription opioid that the
23 patient is taking, correct?

24 A. Yes.

1 Q. And there's no reference in Vowles to
2 dosing levels, is there?

3 A. There is in the underlying studies that are
4 part of Vowles. But in terms of what Vowles, et al
5 report, I do not believe that there is reference to
6 the dosing levels in the underlying studies.

7 Q. And in the chart at page 17 of your report,
8 there's no reference to dosing levels, correct?

9 A. In Figure 1?

10 Q. Yes.

11 A. There's no dose information in Figure 1.

12 Q. And let me ask you to look at page 19 of
13 your report, please.

14 And again, I -- I'll point you about
15 halfway through the bottom paragraph on the page.
16 There's a sentence that reads in your report, "It
17 is well-documented that risks of opioid-related
18 adverse outcomes are heterogeneous by dose and
19 duration of use."

20 Do you see that?

21 A. I do.

22 Q. What do you mean by the risks of "adverse
23 outcomes are heterogeneous by dose and duration of
24 use"?

1 A. Typically that means that adverse outcomes
2 increase with an increase in dose and duration.
3 There's a dose response relationship between harm
4 and opioid use.

5 Q. And so when you say "heterogenous" in that
6 setting, you mean that the risks are going to be
7 different depending on the level of the dose, as
8 well as the duration. Right?

9 A. They're going to increase with dose and
10 duration, yes.

11 Q. Well, they'll be different with different
12 doses and different duration, correct?

13 MR. ARBITBLIT: Objection.

14 Q. Now, Vowles is only measuring the
15 percentage of chronic noncancer pain patients who
16 engage in misuse of prescription opioids, right?

17 MR. ARBITBLIT: Objection.

18 A. Sorry, I'm just waiting for the realtime so
19 I can read this.

20 MS. DO AMARAL: Counsel --

21 A. Vowles is measuring the percentage of
22 misuse, abuse and addiction identified in these 38
23 studies.

24 Q. And so misuse is using prescription opioids

1 without a prescription or not as directed by a
2 doctor; is that correct?

3 MR. ARBITBLIT: Objection. Asked and
4 answered at length in the New York deposition.

5 Q. You can go ahead.

6 A. That is included in the definition of
7 "misuse," but the underlying studies that have
8 measured misuse in the Vowles study have a more
9 inclusive definition that includes other symptoms
10 of opioid use disorder.

11 Q. So the -- Vowles also reports a figure for
12 addiction which you reflect in your chart on page
13 17 of opioid use disorder from moderate to severe
14 of 8 to 12 percent. Correct?

15 A. Yes.

16 Q. And that's an 8 to 12 percent that flows
17 out of the misuse of prescription opioids, right?

18 A. I'm not sure I understand what that means.

19 Q. Well, the 8 to 12 percent is a subset of
20 people who are misusing the prescription opioids,
21 correct?

22 MR. ARBITBLIT: Objection.

23 A. It's people who meet criteria for opioid
24 use disorder at that level. I guess I'm not -- I'm

1 not quite sure what you mean by "subset."

2 Q. Well, what I meant is that the way you've
3 drawn your Venn diagram here on page 17, there's an
4 opioid use disorder from moderate to severe of 8 to
5 12 percent. Those are people who are engaged in
6 misuse of opioids. Is that right?

7 A. Generally speaking, yes.

8 Q. Now, these two figures - the 22 to 29
9 percent figure in the Vowles report that you show
10 on Figure 1 and the 8 to 12 percent figure - those
11 are both measuring prevalence and not incidences;
12 is that correct?

13 A. That is correct.

14 Q. And that would mean it could include people
15 who had either moderate or severe opioid use
16 disorder before they began taking prescription
17 opioids. Is that right?

18 A. I mean, to get moderate to severe opioid
19 use disorder, you have to be exposed to opioids.

20 Q. But not necessarily pursuant to a doctor's
21 prescription. Is that right?

22 A. There is generally a substantial overlap
23 between nonmedical and medical use, although it's
24 not -- I mean, I would agree with you that in terms

1 of the prevalent case, we don't know the entire
2 history of prescription opioid use.

3 Q. And so I'm -- I think this is a point that
4 we can probably readily agree on, that when you're
5 looking at, let's say, this 22 to 29 percent figure
6 of misuse, that's going to include people who are
7 engaged in misuse of prescription opioids before
8 they received a prescription from a doctor.

9 MR. ARBITBLIT: Objection. Assumes
10 facts not in evidence.

11 A. Yeah, I don't have any knowledge of that.
12 I mean --

13 Q. Well --

14 A. -- that's --

15 Q. -- prevalence -- prevalence captures a
16 point that people have a certain characteristic at
17 a certain point in time in a study. Is that right?

18 A. It can.

19 Q. Well, when you -- when you distinguish
20 between prevalence and incidence in your prior
21 answer, prevalence is measuring the attributes of
22 opioid disuse -- opioid use disorder in a
23 population, correct?

24 MR. ARBITBLIT: Objection.

1 A. Prevalence is measuring opioid use disorder
2 in a population, correct.

3 Q. And so that could include people who had an
4 opioid use disorder before they took a doctor's
5 prescription for opioids, correct?

6 A. It could.

7 Q. And likely does, correct?

8 MR. ARBITBLIT: Objection.

9 A. I don't have any information on how likely
10 it is.

11 Q. Okay. This is not measuring the incidence
12 of opioid use disorder among patients who followed
13 doctor's directions in taking prescription opioids,
14 correct?

15 MR. ARBITBLIT: Objection.

16 A. Those incident cases would likely be
17 included in this assessment. It's not exclusive to
18 that number. That's another number that we would
19 use for public health.

20 Q. But it does -- but this study, this Vowles
21 study, is not -- is not identifying the percentage
22 of opioid use disorder among patients who followed
23 a doctor's prescription, correct?

24 A. It is identifying the percentage of opioid

1 use disorder among patients using a doctor's
2 prescription. It doesn't provide information on
3 how closely it was followed.

4 Q. No, but it does -- it's capturing the
5 incidence of opioid use disorder among those who
6 are engaged in misuse of opioids, correct?

7 MR. ARBITBLIT: Objection, asked and
8 answered.

9 A. So it's prevalence of opioid use disorder,
10 and it's among those with noncancer chronic pain.

11 Q. But it doesn't get -- Vowles does not give
12 us a percentage of misuse or addiction arising
13 among patients who followed doctors' prescriptions.

14 MR. ARBITBLIT: Objection, asked and
15 answered.

16 A. I would say that the study includes people
17 who are -- we don't have any information on whether
18 they're following a doctor's prescriptions or not.
19 So that's included in the --

20 Q. Well, we know -- we know that the patients
21 that -- the 21 to 29 percent are people who are
22 engaged in misuse, correct?

23 A. People who have symptoms of opioid use
24 disorder.

1 Q. And have engaged in misuse, correct?

2 MR. ARBITBLIT: Objection.

3 A. Generally speaking, yes.

4 Q. And let me ask you to look at Exhibit 98,
5 please.

6 MS. DO AMARAL: Counsel, we have
7 Exhibit 106 when you need it.

8 MR. HESTER: Oh, thank you. I'll
9 circle back to that in a minute.

10 MS. DO AMARAL: I will need to take a
11 break to get 105, however.

12 MR. HESTER: Okay.

13 KEYES DEPOSITION EXHIBIT NO. 98

14 ("The Prescription Opioid and Heroin
15 Crisis: A Public Health Approach to an
16 Epidemic of Addition" by Kolodny, et
17 al. dated 1-12-15 was marked for
18 identification purposes as Keyes
19 Deposition Exhibit No. 98.)

20 A. 98, yes?

21 Q. Yes, thank you. You have that one there,
22 Doctor Keyes?

23 A. I do.

24 Q. And for the record, Exhibit 98 is a paper

1 written by Andrew Kolodny and others entitled "The
2 Prescription Opioid and Heroin Crisis: A Public
3 health Approach to an Epidemic of Addiction."

4 Doctor Keyes, have you seen this
5 document before?

6 A. I have.

7 Q. And let me ask you to look at page 566,
8 please. And it -- at the very top of the page -
9 it's the first sentence of text - it says, "The
10 incidence of iatrogenic opioid addiction in
11 patients treated with long-term OPRs is unknown
12 because adequately-designed prospective studies
13 have not been conducted."

14 Do you see that?

15 A. I do.

16 Q. And do you agree with that?

17 A. I think there have been studies published
18 that speak to this percentage that I've cited in my
19 report. It's possible they were published since
20 2015. You know, this article is five years old.

21 Q. I want to ask you specifically, though, not
22 about the numbers stated in your report. I'm
23 asking about the "incidence of iatrogenic opioid
24 addiction in patients treated with long-term OPRs."

1 Are you aware of any study that
2 measures the incidence of iatrogenic opioid
3 addiction in patients treated with long-term OPRs?

4 A. Yes, they're cited in my report.

5 Q. Which study?

6 A. I believe the Edlund study speaks to that,
7 in the claims data.

8 Q. Any others?

9 A. I believe there are other studies that
10 measure incidence in the report. I could go
11 through them more carefully, but there's a number
12 of reviews that are cited that speak to incidence.

13 Q. The Edlund study is the one that you have
14 in mind?

15 A. I have -- yeah, I'm thinking about the
16 Edlund study, but I believe there are others as
17 well.

18 Q. When you say --

19 A. -- for example --

20 Q. Well, when we say "the incidence of
21 iatrogenic opioid addiction," that means --
22 iatrogenic opioid addiction means opioid addiction
23 arising out of -- out of treatment under a doctor's
24 care and pursuant to a doctor's prescriptions?

1 A. Yes.

2 Q. Let me ask you now to go back to Exhibit
3 106. That's the one we tried to get a minute ago.

4 KEYES DEPOSITION EXHIBIT NO. 106

5 ("Understanding the Rural-Urban
6 Differences in Nonmedical Prescription
7 Opioid Use and Abuse in the United
8 States" by Keyes, et al. dated
9 February 2014 was marked for
10 identification purposes as Keyes
11 Deposition Exhibit No. 106.)

12 Q. Do you have it there, Doctor Keyes?

13 A. I do.

14 Q. And Exhibit 106, for the record, is a paper
15 written by Doctor Keyes and others entitled
16 "Understanding the Rural-Urban Differences in
17 Nonmedical Prescription Opioid Use and Abuse in the
18 United States."

19 I take it you're well familiar with
20 this document?

21 A. Yes.

22 Q. Let me ask you to look at page E-54,
23 please. And on the left hand column under the
24 heading for Self Medicating for Pain, there's a

1 sentence that reads, "When used as prescribed under
2 medical supervision, opioid analgesics are
3 effective and used as standard practice in managing
4 acute and chronic pain."

5 Do you see that?

6 MR. ARBITBLIT: Objection. We're
7 going over old ground. This is the second article
8 that's going over old ground that's been asked and
9 answered at length in the New York deposition.

10 On the third strike, Counselor, I'm
11 going to get in touch with Judge Wilkes, and we'll
12 see if he thinks this is proper or not.

13 Q. This is a study --

14 MR. HESTER: It would be quite ironic
15 to take the position asking Doctor Keyes about a
16 study involving rural populations is not something
17 we can ask about. But I understand. I mean, you
18 --

19 MR. ARBITBLIT: It's not about ironic,
20 Counselor; it's about duplicative. The article's
21 been the subject of prior questioning. Rule 26
22 says duplicative depositions are harassment and not
23 allowed.

24 MR. HESTER: So --

1 MR. ARBITBLIT: I do -- you can
2 disagree, and we do disagree. This is the second
3 one. I'm allowing it. I'm not going to allow it a
4 third time.

5 MR. HESTER: We can -- we can argue --
6 I don't want to take time arguing about it. I
7 would just say when an expert report is submitted
8 in a case, I'm not sure that the concepts you're
9 relying on apply.

10 But let's go ahead.

11 BY MR. HESTER:

12 Q. Doctor Keyes, do you stand by that
13 sentence?

14 A. I think that sentence reflected the same,
15 you know, deceptive information that the
16 pharmaceutical companies and distributors released.

17 Q. So you don't stand by that sentence?

18 A. I think if I were to write that sentence
19 today, I would provide a lot more nuance to that
20 sentence.

21 Q. What did you mean when you wrote "opioid
22 analgesics are effective"?

23 MR. ARBITBLIT: Objection.

24 A. It was not the topic of the paper, the

1 efficacy of opioid analgesics, and I think that,
2 again, were I to write that sentence today, I would
3 qualify that statement more.

4 But what I meant by that at the time
5 was that there are some indications for which
6 opioids control pain.

7 Q. And you just don't know what those
8 indications are?

9 MR. ARBITBLIT: Object to form.

10 A. I do know the -- I know what the
11 indications are.

12 Q. And what are those?

13 A. I don't want to make a blanket statement
14 about the appropriateness of opioids. It would
15 have to be handled on a case-by-case basis.

16 Q. Oh, I just -- but when you said they --
17 they control pain for certain indications, what
18 indications did you have in mind?

19 MR. ARBITBLIT: Objection.

20 A. Again, I don't want to make a blanket
21 statement about all -- all uses of opioids. It
22 would be on a case-by-case basis.

23 Q. Let's go back to -- let's go back to your
24 report, Exhibit 2, and page 17 again. So Doctor

1 Keyes, looking at this Figure 1, does it reflect
2 that, from among these patients treated for chronic
3 noncancer pain with opioids, there were in the
4 range of 80 -- 70 to 80 percent who did not develop
5 an opioid use disorder?

6 A. I just -- let me read this. 70 to 80
7 percent do not have a prevalent opioid use
8 disorder, just to be clear about the language.

9 Q. And when you say "prevalent," you mean it's
10 not -- you're distinguishing that from incidence.
11 So it would include incidence but it would be
12 broader than incidence.

13 MR. ARBITBLIT: Objection.

14 A. I wouldn't conflate those two in that way.
15 Incidence is not subsumed in prevalence in that
16 way. They're two different measures. Incidence in
17 this case is --

18 Q. What did you mean -- I didn't mean to
19 interrupt. I'm sorry. What did you mean by
20 "prevalence," that you're saying that this is
21 "reflecting prevalence"?

22 MR. ARBITBLIT: Objection.

23 A. It means that the study design was that
24 opioid use disorder was assessed among people with

1 chronic noncancer pain, an overall percentage was
2 estimated.

3 Q. And we don't know how long they were taking
4 the opioids for their chronic noncancer pain?

5 MR. ARBITBLIT: Objection.

6 A. I believe that information is in the
7 underlying studies, so we could go to the
8 underlying studies if that would be helpful.

9 Q. How would -- is that the way you would
10 figure out the duration of treatment for chronic
11 noncancer pain patients in the Vowles study? You'd
12 go and look at the underlying studies to figure out
13 the periods of time that people were being treated
14 with opioids?

15 A. I think that would be one way to estimate
16 duration.

17 Q. Is there any other way you could think of?
18 You don't see it in the body of the Vowles report?

19 A. I don't see it in the body of the Vowles
20 report.

21 Q. And we also don't know the dosing levels
22 for these patients being treated with chronic
23 noncancer pain, correct?

24 MR. ARBITBLIT: Objection, asked and

1 answered.

2 A. I believe that information is in the
3 underlying studies.

4 Q. And again, you'd have to go back then to
5 look at the underlying studies to figure out what
6 the dosing levels were?

7 A. Yes.

8 Q. You mentioned -- let's turn to Exhibit 10,
9 please.

10 KEYES DEPOSITION EXHIBIT NO. 10

11 ("The Role of Opioid Prescription in
12 Incident Opioid Abuse and Dependence
13 Among Individuals With Chronic
14 Noncancer Pain" by Edlund, et al.
15 dated July 2014 was marked for
16 identification purposes as Keyes
17 Deposition Exhibit No. 10.)

18 Q. For the record, Exhibit 10 is a paper
19 written by Mark Edlund and others entitled "The
20 Role of Opioid Prescription in Incident of Opioid
21 Abuse and Dependence Among Individuals with Chronic
22 Noncancer Pain."

23 Doctor Keyes, you've seen this document
24 before?

1 A. Yes.

2 MR. ARBITBLIT: Objection. Counselor,
3 this was addressed at the New York deposition at
4 page 310. Do you have any new questions about it?
5 Or are we replowing old ground?

6 MR. HESTER: I think I have new
7 questions. I think I'm -- I'm questioning based on
8 what Doctor Keyes says in her report.

9 MR. ARBITBLIT: Did you say anything
10 new in this report about Edlund that you didn't say
11 in the New York report?

12 MR. HESTER: I haven't -- I haven't
13 prepared to go back to the New York report. I'm
14 focusing on what's in the West Virginia report
15 that's been submitted in this litigation and asking
16 questions about the scope of Doctor Keyes' opinions
17 in this litigation. And she talks about the Edlund
18 paper.

19 Q. So Doctor Keyes, at page 19 of your report,
20 the bottom paragraph and then over to 20, this is
21 where you refer to the Edlund paper. Is that
22 right?

23 A. I just want to confirm, there are several
24 different Edlund papers that are cited, and I just

1 want to make sure that we're --

2 Q. I hope I've got the -- I hope I've got the
3 right one. I thought I did, but confirm me on
4 that.

5 A. So -- yes, I believe that's correct.

6 Q. Can you -- I mean, if you look at -- let's
7 see, the footnote -- Footnote 60 -- Footnote 60 in
8 your report, you can see that you're citing to this
9 paper that we've got as Exhibit 10. Correct?

10 A. Yes.

11 Q. And so this is a study that involves
12 exposure to differing levels of prescribed opioids.
13 Is that right?

14 A. That's correct.

15 Q. And if you could look at page 562 --

16 MR. ARBITBLIT: Counsel, I'm going to
17 stop the deposition now, and we're going to try to
18 reach Judge Wilkes. You're asking the same
19 questions about the same articles, and I think it's
20 not okay.

21 If Judge Wilkes says it's okay, then I
22 will withdraw the objections, but I don't want to
23 just proceed as if you can do this, which I
24 disagree with.

1 So let's stop the deposition and see if
2 we can reach Judge Wilkes.

3 MR. HESTER: Okay. And I take it this
4 doesn't count against our seven hours of time,
5 correct?

6 MR. ARBITBLIT: That is correct, it
7 does not. So let's --

8 MR. HESTER: All right. Doctor Keyes,
9 you can probably take a rest if you want.

10 VIDEO OPERATOR: Going off the record.
11 The time is 9:53 a.m.

12 (A discussion was had off the record
13 after which the proceedings continued
14 as follows:)

15 VIDEO OPERATOR: This begins Media
16 Unit 2 in the deposition of Katherine Keyes. We're
17 back on the record. The time is 9:54 a.m.

18 MS. DO AMARAL: I can -- I can get him
19 on my cell phone and just hold it next to the
20 microphone. I don't know if that's going to work.
21 Let's give it a try.

22 MR. HESTER: I guess we could also
23 call into a dial-in if you want.

24 MS. DO AMARAL: That may work better.

1 MR. HESTER: Well, let's see if we can
2 get him first, and then we'll figure out mechanics.

3 MS. DO AMARAL: Okay.

4 (A phone call was made to Judge
5 Wilkes.)

6 MS. DO AMARAL: I didn't reach him. I
7 did leave a message.

8 MR. ARBITBLIT: Is there someone at
9 his office who could be reached to find out whether
10 he's available? I don't want to keep counsel
11 waiting unreasonably if he's not going to be
12 available to get back to us shortly.

13 MS. DO AMARAL: I am not aware of
14 another way to contact him other than --

15 MR. ARBITBLIT: Maybe try calling
16 those on the ground in West Virginia to see if they
17 have any insight on how to reach him.

18 MS. DO AMARAL: Okay.

19 MR. ARBITBLIT: Tim, we'll give this
20 about five or ten minutes. Is that all right?

21 MR. HESTER: Yeah.

22 MR. ARBITBLIT: And it's not counting
23 against your time.

24 MR. HESTER: Okay.

1 MR. ARBITBLIT: And I understand
2 you're doing what you think is your job; I'm just
3 doing what I think is mine.

4 MR. HESTER: The -- I take it a
5 corollary in your position, Don, is you would agree
6 that we can use everything that's been done in
7 relation to Doctor Keyes, any of her examinations,
8 in New York, for instance, are available to us in
9 this case?

10 MR. ARBITBLIT: I would have assumed
11 that would be the case. I don't think that my
12 position on it matters. I think she was under
13 oath, her testimony could be used for the purposes
14 that deposition testimony could be used in general.

15 Paulina, are you there?

16 THE DEPONENT: She's on the phone.

17 MR. HESTER: Don, I have -- I have
18 only a few more questions on this. I also want you
19 to have in mind, she submitted a new expert report
20 in West Virginia.

21 I mean, she didn't stand on her New
22 York report; she submitted a new report. And it
23 would --

24 MR. ARBITBLIT: I -- sorry.

1 MR. HESTER: -- it seems -- it seems
2 that the position that you can't examine an expert
3 on a new report is really surprising to me. I --
4 it hadn't even occurred to me that you'd take this
5 position.

6 MR. ARBITBLIT: Well, Tim, it's a
7 little overbroad to say she submitted a new report.
8 I agree with you that there's a report signed
9 August 3rd, but if you compare certain sections of
10 the report, they're identical, and I haven't seen
11 any different description of either the Edlund
12 study or the Vowles study, and certainly not the
13 study that she wrote in 2014 which isn't even in
14 her report.

15 It's something that your partner, Paul
16 Schmidt, brought up on his own.

17 So Rule 26 is specifically about
18 experts, and the rule that I read earlier about
19 duplicative testimony arises in that context.

20 Yes, she submitted a new report, but
21 parts of it are identical, and there's no new
22 report about Edlund, Vowles or the Keyes 2014
23 study. They're identical; they were the subject of
24 prior discussion.

1 If we can't get Judge Wilkes, what I
2 suggest is that we go back on but that I have a --
3 if you would agree to a standing objection to the
4 use of testimony gathered in this deposition based
5 on documents that have been the subject of prior
6 deposition, we could continue on that basis.

7 MR. HESTER: I have no -- yeah. I
8 mean, I understand your objection. I just think
9 when she submits a new report in a new case and
10 she's purporting to offer opinions as to a new
11 jurisdiction - namely West Virginia as compared to
12 New York - I think we're entitled to examine her
13 about it.

14 I really have very little -- I have
15 very little more that's going over this Edlund
16 issue.

17 MR. ARBITBLIT: Well, you know, I
18 think --

19 MR. HESTER: I think -- and then I
20 think we transition on to stuff that's much more
21 directly targeted on West Virginia issues.

22 MR. ARBITBLIT: Okay. I have a list
23 of articles that were the subject of prior inquiry.
24 If you can tell me that they're not going to be

1 part of today's inquiry, that would solve the
2 problem.

3 MR. HESTER: I don't think I -- I
4 don't think I can tell you that articles aren't the
5 subject of inquiry. I can't -- I can't give you
6 that broad a commitment. I think what I can tell
7 you is I'm focusing on what she's written in this
8 report. That's all I focused on.

9 But I --

10 MR. ARBITBLIT: Okay. Well, I
11 understand your position, and if you're agreeable
12 to the standing objection and we can't get Judge
13 Wilkes promptly, then that's how I suggest we would
14 proceed.

15 MR. HESTER: All right.

16 MS. DO AMARAL: Gentlemen, I tried
17 other avenues and was not able to reach Judge
18 Wilkes. I have left him a message and left him my
19 cell phone number to return the call.

20 As I understand it, he is prompt in
21 doing so unless there is some other matter that
22 he's working on at that precise moment. So as we
23 hear from him, I'll certainly let everyone know.

24 But at the moment, we are not able to

1 reach him.

2 MR. ARBITBLIT: Tim, are you willing
3 to hold this Edlund topic in abeyance and go on to
4 the other points that you said were not referring
5 to previous articles so that when Judge Wilkes
6 calls back, we can advise him of the status as of
7 the time we're having this discussion?

8 MR. HESTER: Yeah, I think I can hold
9 this in abeyance.

10 MR. ARBITBLIT: I appreciate that
11 courtesy.

12 Can we get the witness back in and if
13 you want to put something on the record about this
14 now, we can, or we can wait until we have Judge
15 Wilkes.

16 MR. HESTER: Why don't we just wait
17 until we have Judge Wilkes.

18 VIDEO OPERATOR: Okay. We've stayed
19 on the video record. Teresa, I'm not sure if
20 you've stayed on the record as well.

21 MS. DO AMARAL: We have Judge Wilkes.

22 THE COURT REPORTER: Yes, I've been on
23 the record the whole time.

24 VIDEO OPERATOR: Okay.

1 MR. ARBITBLIT: Do we have Judge
2 Wilkes on the phone now?

3 MS. DO AMARAL: Yes, we do have Judge
4 Wilkes. I'm putting him on speaker.

5 Judge Wilkes, can you hear me?

6 SPECIAL MASTER WILKES: I can.

7 MS. DO AMARAL: Counsel, can you hear
8 him?

9 MR. ARBITBLIT: Yes.

10 MR. HESTER: Yes, we can.

11 MR. ARBITBLIT: Judge, this is Don
12 Arbitblit of Lieff Cabraser, one of attorneys for
13 plaintiffs in the MDL. Good morning. I'm sorry to
14 disturb your day.

15 Counsel for defendants and I are
16 having a disagreement about the proper scope of
17 this deposition, and we'd just like a moment of
18 your time to state our positions and see whether we
19 can get some resolution.

20 Briefly, our position is that a Rule
21 26(b)(2)(C) in the context of expert depositions
22 states, "On motion or on its own, the Court must
23 limit the frequency or extent of discovery
24 otherwise allowed by these rules if it determines

1 that the discovery sought is unreasonably
2 cumulative or duplicative."

3 In this case, the witness is Katherine
4 Keyes, an epidemiologist who has already been
5 deposed in the MDL and in the New York case for a
6 total of 14 hours.

7 The same firm, the same defendant, the
8 same witness. We've had 50 minutes of testimony in
9 which three of the four articles introduced on the
10 examination were subject to inquiry in previous
11 deposition testimony.

12 It is our position that this amounts to
13 different answers about the same studies, that
14 there was a full opportunity to depose on those
15 subjects and the questions themselves are
16 identical, and certainly the studies being asked
17 about are identical, and we don't think that that's
18 appropriate under Rule 26(b)(2)(C) to be going over
19 old ground and seeking new answers to the same --
20 on the same studies.

21 That's our position. We would ask that
22 -- certainly the witness has submitted a new
23 report. However, as to these particular items,
24 there's been nothing new in the report, and

1 particular studies by the Vowles, V-O-W-L-E-S,
2 Edlund, E-D-L-U-N-D and a study the witness herself
3 wrote that was not in her report but was used for
4 impeachment by Mr. Hester's co-counsel at
5 Covington. None of those have changed.

6 It's the same material, different
7 questions, and we think it's not appropriate.

8 MR. HESTER: Judge Wilkes, this is Tim
9 Hester, Counsel for McKesson from the firm of
10 Covington & Burling. Doctor Keyes has submitted a
11 new expert report in the West Virginia litigation.
12 She's admittedly submitted expert reports in New
13 York and in the Ohio litigation as well, but she's
14 given -- she's given a separate expert report in
15 the West Virginia litigation, and we are seeking to
16 inquire into those opinions she stated in the West
17 Virginia litigation, and there's not an intent to
18 cover old ground, but we're focusing not on the New
19 York litigation; we're focusing on the expert
20 report she gave in this West Virginia case, and it
21 seems to me we should be entitled to ask her a full
22 range of questions about the opinions that she has
23 given in the West Virginia litigation.

24 Some of those opinions involve

1 documents that were cited and relied on by her in
2 the New York litigation as well, but here, we're
3 seeking to develop testimony for purposes of the
4 West Virginia litigation and the trial that's
5 upcoming.

6 The standard articulated by counsel,
7 "unreasonably cumulative or duplicative" is not
8 applicable here in the sense that we're asking a
9 few questions about several documents that were the
10 subject of questioning in other -- in other
11 examinations previously of Doctor Keyes, but we're
12 not -- we're not engaged in unreasonably
13 duplicative or cumulative questioning.

14 We're asking about a new expert report
15 and her opinions that she's providing in this
16 litigation which should be viewed as distinct from
17 what she has done previously in the New York or the
18 Ohio litigation.

19 MR. ARBITBLIT: Judge, if I could just
20 respond very briefly. The specific articles that
21 are in question have nothing to do with West
22 Virginia at all. They are generic to opioid use
23 and there are public -- there are new opinions in
24 the West Virginia report that we believe are fair

1 game for inquiry.

2 What we don't agree are fair game is
3 going back to places in the previous reports where
4 identical documents were addressed on a generic
5 basis and were the subject of full inquiry.

6 There's plenty of new material that
7 could -- could be the proper focus of discovery and
8 inquiry, and we're not objecting to that. The mere
9 fact that she submitted a new report does not mean
10 that every sentence of it - when in fact, the vast
11 majority of it - is the same as it was in the
12 previous two, including the three articles that I
13 just mentioned.

14 No changes.

15 SPECIAL MASTER WILKES: Okay. Well, I
16 think one thing -- does someone want to add to
17 that?

18 MR. RUBY: Judge, this is -- this is
19 Steve Ruby for Cardinal Health. I know this has
20 come up before with fact witnesses, a couple of
21 questions in that regard one -- in that situation
22 where there was a desire on the part of a party not
23 to have its fact witnesses redeposed, and I know
24 this may be something that's on your mind as this

1 issue comes up.

2 That was all handled well in advance of
3 the deposition. The issue was raised, an order was
4 entered by you that dealt with this ahead of time.
5 And everybody had an opportunity to prepare for the
6 deposition accordingly.

7 That hasn't been done here, and so it
8 seems to me that the appropriate thing to do is to
9 -- is to proceed with the deposition. If there are
10 issues that need to be raised with Judge Faber
11 relating to this testimony at trial, they can be
12 raised then.

13 The other point that I would note is
14 that the witness here is a -- is a retained expert
15 witness, and so I think the calculation with
16 respect to burden is a different calculation.

17 So as we sit here right now with
18 Mr. Hester ready to take the deposition and having
19 prepared for the deposition, it -- again, and
20 having had no notice of these issues with respect
21 to this witness - unlike the other situations that
22 you've dealt with - I don't see -- I don't see any
23 good reason not to be able to explore the studies
24 that have been provided in her report, by -- she's

1 provided in this --

2 SPECIAL MASTER WILKES: I'm losing you
3 there a little bit, Mr. Ruby. I'm sorry. Could
4 you repeat what you said?

5 MR. RUBY: Yes, Judge, I -- I was just
6 summarizing there at the end, given the fact that
7 these -- this hasn't been raised in advance of the
8 deposition, Mr. Hester has prepared to take the
9 deposition based on the fact that the witness has
10 submitted an expert report in this West Virginia
11 litigation that cites these studies, and this is a
12 -- a retained expert who has proffered her opinions
13 specific to this West Virginia litigation.

14 It seems to me that this is different
15 from the situations where you have imposed
16 limitations in the past, and the appropriate thing
17 to do is to let the deposition go forward and to
18 address -- to let Mr. Hester address the studies
19 that, as I said, have been cited in the report that
20 was produced specifically in this West Virginia
21 litigation.

22 MR. ARBITBLIT: May I briefly be
23 heard, Your Honor?

24 SPECIAL MASTER WILKES: Sure.

1 MR. ARBITBLIT: I think that the
2 Federal Rules of Civil Procedure provide all the
3 notice that any party could ever ask for, and the
4 -- what they specifically say in the context of
5 experts, under Rule 26, is that duplicative --
6 "unreasonably cumulative or duplicative discovery
7 must be foreclosed."

8 "The Court must limit." It's not
9 "shall" -- it's not "may." It's "must." So I
10 don't know what further notice could be required.

11 I didn't -- I certainly didn't come
12 into the deposition thinking that Mr. Hester was
13 going to plow old ground and try to elicit new
14 answers. And I don't think -- certainly Mr. Hester
15 during the break has said that he has other
16 subjects that are not cumulative and duplicative of
17 previous depositions, and the witness has a report
18 that includes quite a bit of West Virginia-specific
19 information which is a fair target for his inquiry:

20 SPECIAL MASTER WILKES: Okay. Go
21 ahead. Were you cut off?

22 MR. ARBITBLIT: No, I'm done, Your
23 Honor. Thank you.

24 SPECIAL MASTER WILKES: Okay. Well,

1 two things. I think that we need to -- we need to
2 keep in mind here. Number one, we have an overall
3 limit as to the time of the deposition, so how --
4 how a party wants to use that time - whether they
5 feel, you know, it's more fruitful to use it
6 rehashing some other stuff - is one consideration
7 and anticipating that you guys, you know, your
8 seven hours is going to be used discussing
9 something.

10 I think in prior -- prior instances,
11 we've had similar issues and, you know, it's
12 limited to the quality of the time used in the
13 limited quantity of time, number one.

14 Number two -- and I am mindful of
15 plaintiff's concerns because we have direction from
16 the Court that discovery is to be limited to unique
17 issues to this case, because of the vast majority
18 of discovery having already been done in the large
19 MDL that's seeking to be limited to unique
20 jurisdictional issues.

21 I don't think that because it's a
22 report submitted in this case that automatically
23 opens up that -- all inquiry to the same issues
24 that may have been gone over previously, so the

1 ruling for today will be that in such ways as the
2 expert's opinion differs -- her testimony today
3 differs from previously-given testimony, it's fair
4 game and can be inquired into.

5 So you have to do a little bit of
6 inquiry on certain issues: "Does your opinion
7 differ" or "How does it apply to the West Virginia
8 case?" And then that's fair game.

9 But I think we have an overriding Court
10 Order limiting discovery that's unique to the
11 jurisdiction -- jurisdictional issues. So
12 hopefully that will narrow it down some in that the
13 general subjects that have already been inquired
14 into in the MDL should not be rehashed unless there
15 is some difference unique to the Cabell
16 County/Huntington jurisdictional issues.

17 Does that make it clear?

18 MR. HESTER: Judge, this is Tim
19 Hester, counsel for McKesson. Let me just ask for
20 a clarification, though, on one point. I
21 understand -- I understand Your Honor's ruling in
22 relation to a particular document that may have
23 been discussed or the subject of examination in a
24 prior deposition of this witness.

1 But there are a number of opinions that
2 this witness is expressing that relate to
3 activities in West Virginia that might also relate
4 to activities in other jurisdictions. For
5 instance, the supply of opioids. She's providing
6 opinions about supply of opioids in West Virginia.
7 There's parallels to things she has said about New
8 York or Ohio, but it does seem to me we need to be
9 able to inquire into her opinions on issues that
10 relate to West Virginia, even if there's a parallel
11 or analogous set of opinions she's provided as to
12 New York or Ohio.

13 I wanted to understand if the Court has
14 that in mind, as you state your ruling here.

15 SPECIAL MASTER WILKES: Yes,
16 absolutely, you're entitled to inquire as to that
17 which goes into West Virginia, even if it's the
18 same opinion as in the others, because I think the
19 burden -- plaintiffs still bear the burden of
20 proving the nuisance in West Virginia, and these
21 are events that are fact-specific to West Virginia
22 so certainly you're entitled to inquire into that.

23 MR. ARBITBLIT: Can I ask, Your Honor,
24 whether it would be appropriate to have -- in the

1 case of material or questioning that's been raised
2 in prior cases as a preliminary question from
3 defense counsel, "Does your opinion concerning this
4 have any different impact or meaning for the West
5 Virginia case compared to the Ohio case or the New
6 York case?"

7 And I would submit that in the three
8 instances we're talking about, the language of the
9 report is identical; the cases -- they don't have
10 any bearing on West Virginia or Ohio or New York or
11 any specific jurisdiction; they don't have a
12 bearing on Mr. Hester's concern about the opioid
13 supply to Cabell/Huntington, and the answer would
14 be no, they don't have any different meaning in
15 this case than they had in the previous.

16 So rather than allowing a blanket
17 "Let's just inquire and see what we find out how it
18 applies to West Virginia," if there's a preliminary
19 question to the witness, "Does your opinion in the
20 West Virginia case change based on this particular
21 article, does it have any bearing on West Virginia
22 specifically, and if so, what," I think that would
23 address both concerns.

24 We wouldn't get a rehash of things that

1 are generic to opioids nationwide or data analysis
2 of rates of OUD nationwide, and we would allow
3 defense counsel to inquire as to anything that's
4 jurisdiction-specific.

5 MR. HESTER: Well, Your Honor, this is
6 Tim Hester. If I could be heard on that point.
7 It's a little hard -- it's a little hard to be that
8 precise, to articulate a point that the witness
9 then agrees or disagrees is different or not
10 different from what she said in New York or Ohio.

11 It seems to me we need to be able to
12 inquire into certain topics and ask questions that
13 allow us to explore the basis for her opinions on
14 issues that relate specifically to activities in
15 West Virginia.

16 She's talking about things such as
17 supply of opioids in West Virginia; she's talking
18 about issues involving heroin and fentanyl use in
19 West Virginia. We should be able to ask her about
20 those subjects, whether or not she gives a
21 generalized answer that she has a parallel view on
22 New York and Ohio, because she's providing
23 testimony that relates specifically to the
24 circumstances in West Virginia, even if there's

1 parallel or analogous views that she has in other
2 jurisdictions.

3 MR. ARBITBLIT: And with all due
4 respect, Your Honor, that would be an exception
5 that swallows the rule that Your Honor just stated.
6 There's nothing in what Mr. Hester just stated
7 generically that applies to the articles that have
8 come up. There were no questions about how this
9 bears on Cabell County or Huntington; they were
10 generic questions about rates of OUD or misuse in
11 general. They had --

12 There wasn't -- if you look through the
13 transcript, there wasn't a mention of West Virginia
14 once in those questions about these articles. So
15 basically he's trying to make up an exception that
16 would allow him to do exactly what he was planning
17 to do all along.

18 SPECIAL MASTER WILKES: Well, we're
19 moving forward. I don't have the transcript in
20 front of me. I don't know what those questions
21 were. But moving forward, they are going to be --
22 they have to be jurisdictionally-specific.

23 And I -- I surmise that the opinions --
24 the expert's opinion is not going to change in

1 regards to the cause and effect or remedial aspects
2 from any of the jurisdictions. But defendants are
3 entitled to inquire specifically as to that cause
4 and effect in West Virginia, because they have to
5 defend against proving what have -- you know, that
6 their actions were the cause of, contributed to
7 what plaintiffs allege in Cabell/Huntington.

8 So what he asked previously, I can't --
9 I'm not going to comment on. But moving forward,
10 it is going to have to be somewhat premised with
11 the inquiry as to "How did this affect, or how did
12 this apply in Cabell/Huntington, and does it differ
13 from the testimony previously given on any other
14 points."

15 MR. ARBITBLIT: And just to -- go
16 ahead, Your Honor.

17 SPECIAL MASTER WILKES: --
18 jurisdictionally specific.

19 MR. HESTER: But -- Your Honor, this
20 is Tim Hester again for McKesson. And just to go
21 back to a point that Mr. Ruby had made that I do
22 want to reiterate: This was -- if the plaintiffs
23 were taking this position - which frankly is a
24 surprise to us - we have expert -- we have expert

1 reports submitted in West Virginia that obviously
2 have overlaps with expert reports submitted in New
3 York or Ohio.

4 We were not aware until the midst of
5 this deposition that the plaintiffs were taking the
6 position that if there's some duplication - in
7 other words, if the witness copied something out of
8 her New York report and put it into West Virginia -
9 that somehow we -- we're not entitled to inquire
10 into it because it's, quote, the same.

11 We were not put on notice of this.
12 We're being put into a position in the midst of a
13 deposition, having to sift out what is new or what
14 is different from what was previously submitted by
15 this witness. That seems too high a burden for an
16 expert report, that we have to go back and figure
17 out what she previously said in other jurisdictions
18 and then parse through how we differentiate.

19 This -- as Mr. Ruby pointed out, when
20 this has come up previously, it was in the context
21 of fact witnesses, but it was done in advance of
22 the deposition so there could be an opportunity to
23 plan.

24 If the plaintiffs were taking this

1 position, we were certainly not apprised of it.
2 And so we're really put in a -- in a very difficult
3 - and I think prejudicial - situation here, Your
4 Honor.

5 SPECIAL MASTER WILKES: Well, I think
6 you should have been on notice of it because of the
7 order that said discovery is going to be limited to
8 fact-specific and not duplicative of what took
9 place in the other MDL actions. So -- you know,
10 that's just been the general trend through the
11 whole matter.

12 I understand it's an expert and there's
13 more leeway there, but it is still discovery. So
14 -- you know, I think everyone has been cognizant --
15 or should have been cognizant of that limitation.

16 And in the fact witnesses -- in fact,
17 all that was done is reiteration, the fact that
18 it's going to be oftentimes geographically limited.
19 Some, I think -- and I'm thinking back, even
20 geographically limited as to the facts and
21 discovery occurring into West Virginia.

22 So I don't think you're prejudiced by
23 the fact because you have that information that
24 you're inquiring again. If there's something new

1 that's specific to West -- to this case, then
2 you're entitled to inquire that way.

3 I'm not in any way saying you're
4 precluded from asking how the application of that
5 opinion applies to West Virginia or applies to this
6 case, but if the -- if the witness says, you know,
7 "I opined X and Y equals Z in the New York case" or
8 "on another case" and then the next question is,
9 "Well, is there any -- does it have any different
10 application to West Virginia?"

11 If they say, "No," then you live with
12 that opinion because it's -- you previously had the
13 opportunity to flesh it out.

14 So I don't think it's prejudicial
15 whatsoever, and you know, I just think that we have
16 to be cognizant of the fact that we're -- we're
17 looking at a specific jurisdiction for the elements
18 of proof here, and that's what the discovery - even
19 experts - should be limited to.

20 MR. HESTER: Well, Your Honor, I mean,
21 I understand your position, and just to state our
22 position on the record so it's clear, we understood
23 the limitations on fact discovery, but to our
24 knowledge, those have not been applied to expert

1 opinions.

2 This is an opinion she's stating in
3 this litigation, and we're not being permitted to
4 inquire fully into it. It's not the same principle
5 as -- as fact discovery where there was an effort
6 to avoid duplication of facts.

7 This is the expert opinion that's being
8 offered in West Virginia, and we're now being told
9 in the midst of the deposition that we have to sift
10 through and figure out what -- what she copied from
11 her report out of New York or Ohio and what is new.

12 That's a -- that's a quite difficult
13 standard to abide by, and it puts us in a
14 prejudicial position that's different from a fact
15 witness who's not subject to redeposition on the
16 same facts.

17 This is an expert opinion being offered
18 by a retained expert, and we had not understood
19 that there would be this suggestion that somehow if
20 she had a passage in her report in New York that
21 she has copied into her West Virginia report that
22 somehow we're precluded or limited in what we can
23 ask about that opinion in West Virginia.

24 So with respect, Your Honor, I would

1 view this as -- or would submit it should be viewed
2 as different from the -- from the way in which the
3 Court has handled fact witnesses.

4 SPECIAL MASTER WILKES: Well, on that
5 subject, explain to me why it is different
6 information that you've not already had the
7 opportunity to inquire into.

8 MR. HESTER: Because her opinions
9 relate -- they may be a generalized opinion that
10 has a general background or predicate that is
11 comparable to what she said in New York or
12 comparable to what she said in Ohio, but it has
13 applications to this community that are different.

14 The implications --

15 SPECIAL MASTER WILKES: Well --

16 MR. HESTER: Go ahead.

17 SPECIAL MASTER WILKES: I think you're
18 not -- you're not understanding me. You're
19 entitled to inquire to that, how it is different in
20 -- to this litigation. You're entitled to make
21 that inquiry.

22 MR. ARBITBLIT: And if the witness
23 says it's not different, then the inquiry is
24 foreclosed. Correct, Your Honor?

1 MR. HESTER: Well, Your Honor, that's
2 -- we need -- we need to have some leeway here to
3 be able to ask her threshold questions to build up
4 to the West Virginia-specific pieces. We can't be
5 precluded from a subject just because she says, "I
6 have a general view that is the same."

7 Because the general view needs to be
8 applied in relation to the West Virginia-specific
9 facts.

10 SPECIAL MASTER WILKES: So ask her
11 that. Ask her how her general view applies to West
12 Virginia facts. But that general view, you've
13 already had the opportunity to inquire into.

14 MR. HESTER: Well, but, Your Honor,
15 I'll give you a specific example. She was asked
16 about -- she was asked about a paper that she wrote
17 on -- on the use of opioids in rural communities,
18 and she was asked about that in New York. It's one
19 of the papers that counsel objected to my asking
20 her about today.

21 In the New York litigation, she said,
22 "Well, I don't know whether this is really a rural
23 area to which this would apply."

24 I mean, we need to be able to have a

1 little room to maneuver, is all I'm suggesting, to
2 build some basic questioning about elements of her
3 opinion that then allow us to get to West
4 Virginia-specific facts.

5 What I'm concerned about is we're gonna
6 be put in a posture where we have to ask her a
7 generalized question, "Is your view on a certain
8 subject the same or different in West Virginia?"
9 You -- we need to be able to ask her the general
10 questions about the subject in order to get to the
11 specific questions about West Virginia.

12 I -- we shouldn't be precluded from an
13 area of inquiry simply because her view on the
14 general topic is the same as in New York or Ohio
15 because we need to ask the general questions to get
16 to the specific new West Virginia questions.

17 MR. ARBITBLIT: Your Honor, that's a
18 very misleading reference to the article that
19 Mr. Hester just made.

20 MS. DO AMARAL: Hang on, Don.

21 SPECIAL MASTER WILKES: Hold on. Why
22 do you have to ask the general questions if the
23 inquiry is, "No, my view's not different"?

24 MR. HESTER: Your Honor, because --

1 because it's more nuanced than that. It's not as
2 simple as, "Did the car go through the red light?"
3 It -- these are very subtle points that she's
4 testifying to.

5 We have to have a common understanding
6 on the general points to -- in order then to be
7 able to ask her specific questions about how that
8 applies to West Virginia.

9 What I'm concerned about is that we'll
10 be put in a posture where in the midst of this
11 examination, she says, "Well, my general view" on
12 X, Y, Z subject --

13 (Random overtalk from someone with
14 their sound not muted.)

15 MR. HESTER: I think somebody is on
16 the line --

17 MR. RUBY: I think somebody is on the
18 call --

19 MS. DO AMARAL: Mr. Ruby? I think you
20 may need to mute your phone.

21 MR. RUBY: No, not me. I was pointing
22 out that somebody was on a call on the other line.

23 MS. DO AMARAL: Apologies.

24 MR. ARBITBLIT: Your Honor, if I may,

1 the article that Mr. Hester referred to about
2 rural/urban differences, his question had nothing
3 to do with the aspects of that article. Instead,
4 it was the identical question that was raised by
5 his partner Paul Schmidt in a previous deposition
6 about whether opioids are effective for chronic
7 pain based on one sentence that the witness has
8 written in 2014.

9 It was the identical question, seeking
10 a different answer, and it had nothing to do with
11 West Virginia. The sentence is, "When used as
12 prescribed under medical supervision, opioid
13 analgesics are effective and used as standard
14 practice in managing acute and chronic pain."

15 That was the sentence that counsel read
16 to her. Had nothing to do with West Virginia or
17 rural/urban differences. It's the same quote that
18 his partner pulled out of this six-year-old article
19 less than six months -- or eight months ago in
20 another deposition and it -- that's a perfect
21 example of why they shouldn't be allowed to plow
22 old ground.

23 MR. RUBY: Judge, this is Steve Ruby
24 again. I think -- and I don't want to put words in

1 Mr. Hester's mouth, but I think what he is saying
2 is there will be situations in the course of this
3 deposition where he needs to lay foundation for
4 West Virginia-specific questions, where it's not
5 possible to simply jump in and say, "Do you agree
6 that -- that this applies to West Virginia" where
7 in other words, there will need to be some
8 foundation laid as to what this is. So you can
9 imagine a series of questions along the lines of
10 "You agree" -- or "It is your opinion that the
11 supply of opioids functions in X manner, and the
12 basis for that opinion is Y, and" so on and so on,
13 leading up to what I think everyone agrees would be
14 a necessary and appropriate question, which is "Do
15 you -- is it your opinion that the supply of
16 prescription opioids functions in the same manner
17 in West Virginia and that it functioned in the same
18 manner with respect to Cabell County/Huntington,
19 how is it that you've reached that conclusion and
20 what do you base that on?"

21 And correct me if I'm wrong, but I
22 don't take your ruling to be so broad as to
23 preclude good faith foundational questions that are
24 necessary in order to -- in order to establish or

1 permit the asking of the West Virginia-specific
2 questions.

3 MS. DO AMARAL: Mr. Ruby, it's getting
4 harder to hear you.

5 MR. RUBY: Judge, does that -- did you
6 catch all that?

7 SPECIAL MASTER WILKES: I caught most
8 of it, and actually, Mr. Ruby, as you often do, you
9 put it in better words than I do. That's exactly
10 right. I understand you're going to have to make
11 some inquiry to make the determination as to
12 whether or not it is jurisdictionally unique, and
13 that's allowable.

14 What is not is just to go back and
15 knock out -- attempt again to rehash the general
16 basis of the opinions that have been subject to
17 inquiry at previous depositions.

18 That's the duplicative part. I
19 understand that you have to lay a foundation, you
20 have to lay a basis to get into whether or not
21 there is a difference, and that is correct, and I
22 think there can be -- and that's fair game.

23 Because there could be an inquiry as to
24 the knowledge of the jurisdiction and why the

1 expert opines that that previous opinion they hold,
2 why it's applicable to this jurisdiction that's a
3 part of this lawsuit.

4 So yes, I understand that. What I want
5 to get away from is just a rehashing and reinquiry
6 of the previous depositions. But yeah, there has
7 to be some leeway in setting the foundation, and
8 it's only fair to the witness also to let them have
9 an opportunity to explain how they feel it's
10 applicable or not to this jurisdiction.

11 So I think Mr. Ruby gets -- gets it.

12 MR. ARBITBLIT: Your Honor, if I may,
13 this is Don Arbitblit again responding to that.
14 Again, I don't want the foundation exception to
15 swallow up the rule and have Mr. Hester asking all
16 the questions he planned to ask and then at the end
17 of his sequence of questioning ask, "How does this
18 apply to West Virginia?"

19 We're talking about articles that, by
20 and large, the literature that the witness -- if
21 the witness relied on something that's specific to
22 West Virginia, it's fair game. But if the
23 witness -- as is the case with what's been raised
24 previously and as is the case with the vast

1 majority of her references in her report, they're
2 national studies. They're studies of populations
3 that -- that inform her opinions.

4 If the initial foundational question
5 should be, "Do you have any opinions about this
6 study that are specific to West Virginia?" That
7 would abide by Judge Faber's order and with Your
8 Honor's formulation of the question that this needs
9 to be jurisdiction-specific.

10 The foundation isn't, "Did this study
11 say X, Y and Z and did this study relate to
12 incidence or prevalence or did this study relate to
13 the misuse or opioid use disorder," which are all
14 generic questions that have been asked in this
15 deposition about materials that are not specific to
16 West Virginia.

17 So to the extent foundation is that
18 question, do you have any opinions about this
19 article that are specific to West Virginia" as
20 opposed to generic to your overall opinion, then
21 fine, ask the question and the witness can answer
22 it. And if the answer is "Yes," then you can
23 proceed with further questioning.

24 But if the answer is "No," it's the

1 same as it would have been in the previous
2 litigation at the time of the previous deposition,
3 then, I -- I don't see how that type of inquiry
4 would abide by Judge Faber's ruling or your own.

5 MR. RUBY: But Judge, I think that --
6 with due respect to opposing counsel --

7 MR. ARBITBLIT: The judge is speaking,
8 Steve.

9 SPECIAL MASTER WILKES: I'm not far
10 off on that at all. But there also has to be the
11 ability to inquire as to why you don't think it is,
12 just as if there is the urban/rural difference or
13 something else.

14 There has to be -- there has to be the
15 ability to inquire in regard to -- to some
16 hypothetical that may be posed as to, "Well, why do
17 you not think it's applicable here because we have
18 a rural community or we have an urban community,"
19 so I can't limit it just to -- to a "No," but they
20 also have to have the opportunity to inquire as to
21 why they don't think it's applicable or why it is.

22 But besides that, I agree with you.
23 The foundation can be very limited in regards to
24 these studies.

1 MR. HESTER: But yet, Your Honor --
2 this is Tim Hester again. Just to make sure I
3 understand the scope of what you're saying, that
4 setting the foundation about her opinion on a
5 subject requires some questioning about her views
6 that may be general, but then lead to the West
7 Virginia-specific points.

8 And I just want to make sure I've got
9 the ability to ask her questions about her general
10 view on certain points and then to turn to West
11 Virginia.

12 I don't want to have to cut off the
13 entire inquiry simply because her general view is
14 the same as her general view in New York and Ohio.

15 I need to be able to set that
16 foundation before I then ask her the West
17 Virginia-specific pieces of it.

18 MR. ARBITBLIT: That is exactly the
19 opposite of what is necessary. That is exactly the
20 exception trying to swallow the rule. That is
21 exactly trying to ask the same questions about the
22 substance of the article in question rather than
23 asking whether it has any bearing on West Virginia.

24 SPECIAL MASTER WILKES: Have you guys

1 -- have you guys ever heard of the old phrase about
2 choking on a gnat and swallowing a camel? Because
3 I -- because I think that's where we've gotten.

4 Whether the substance swallows the
5 rule or not, you know, the law's a wonderful thing
6 and it's a search for the truth, and you scratch
7 your head and wonder why there are a thousand and
8 one exceptions to this ability.

9 But -- here's the general thing: You
10 guys know what I'm saying. It has to be fact --
11 you have to be able to map it into
12 jurisdictionally-specific continued discovery and
13 inquiry.

14 Now, whether you want to call it
15 foundational or whether you want to call it at the
16 end of, you know, the witness saying, "Yes, I think
17 it applies" or "No, I don't," then asking the
18 question after that, that's fine. I don't care.

19 But the premise of it is: You don't
20 have to rehash the validity and the formulation of
21 the opinion, but you can inquire as to the
22 application of that opinion to West Virginia, and
23 you could inquire as to the expert's reasoning for
24 maintaining that opinion in this case or not

1 maintaining it.

2 But the opinion has been inquired into
3 previously. That's been the subject of previous
4 depositions. So that -- it then becomes cumulative
5 in this case.

6 So we have to hone it down to be a
7 little more to its application to this specific
8 jurisdiction, this specific case.

9 So if there's a report as to the
10 number or frequency of opioids distributed in
11 Cabell/Huntington and you can say, "Does that
12 opinion that you formed from this national report"
13 or "you've taken from this, does that apply here in
14 Cabell/Huntington in this case?"

15 "Yes."

16 "Well, why?"

17 And then they can explain specifically,
18 jurisdictionally-specifically.

19 Or if they say, "No," you can say,
20 "Well, why," and then you can inquire as to the
21 difference.

22 That's what I'm saying. So we don't
23 need to -- let's not get too formed up into the
24 rule and all. But if it's been inquired into and

1 it's a basic opinion, then that's off limits.

2 That's duplicative.

3 If it can be specifically inquired
4 into, yes, and its application in this case. And
5 that's as clear as I can make it.

6 MR. ARBITBLIT: Thank you, Your Honor.
7 May I assume that the same ruling applies to the
8 deposition of another witness who's also been
9 subjected to 14 hours of deposition testimony
10 that's coming up on Thursday?

11 SPECIAL MASTER WILKES: I would hope
12 so, but you know -- it's not -- it's not unique to
13 these. It's been a trend that's gone on through
14 the discovery, whether it be written or deposition
15 discovery, and I think it needs to continue
16 through.

17 If there's specific problems, give me a
18 call, I'll do my best to try to resolve them. But
19 basically, yes.

20 And it goes to both plaintiffs and
21 defendants. If it's been inquired into -- and it's
22 what I'm going to call a "general opinion," then we
23 should gloss over it and move into
24 jurisdictionally- specific application of those

1 opinions.

2 MR. ARBITBLIT: Your Honor, there's an
3 article pending at the time of this call by Edlund,
4 which was a study that wasn't West Virginia-
5 specific. It was a study of the incidence of
6 various degrees of exposure and duration to opioids
7 and what incidence of OUD resulted.

8 I would assume based on this discussion
9 that the next question that Mr. Hester asks of the
10 witness should be "Does your opinion about the
11 Edlund study change based on the fact that this
12 case is in West Virginia as opposed to New York or
13 Ohio?"

14 And if she says, "No," then that should
15 be the end of it. And I'm assuming also that
16 Mr. Hester disagrees with me, and I'd rather hash
17 this out now than have to get back on the phone
18 with you.

19 SPECIAL MASTER WILKES: Well, let me
20 ask this question, because the answer -- it will
21 quickly maybe resolve it. Was that study published
22 prior to any of the -- this expert's depositions
23 previously?

24 MR. ARBITBLIT: Yes. It's a 2014

1 study.

2 SPECIAL MASTER WILKES: Okay. So why
3 would that change?

4 MR. ARBITBLIT: I'm sure -- I'm sure
5 it hasn't. That's the whole --

6 MR. RUBY: Judge --

7 SPECIAL MASTER WILKES: Okay.

8 MR. RUBY: Judge, it seems to me that
9 it doesn't need to be -- based on the ruling that
10 you've made, it doesn't need to be that
11 restrictive. And I think as you said at the
12 beginning, we have a limited amount of time, and if
13 Mr. Hester wants to ask 50 questions about various
14 variables that are related to West Virginia, "Did
15 you consider this aspect of the situation in West
16 Virginia," "Did you consider that aspect," I don't
17 think there'd be any prohibition on asking those
18 questions simply because the witness is a very high
19 level know as to whether she has any different
20 opinion relating to West Virginia.

21 I think we're absolutely entitled. I
22 think I heard you say that we're entitled to probe
23 the bases for the witness' conclusion or the
24 witness' rendering of the same opinion with respect

1 to West Virginia.

2 And I think that is important here, and
3 it's important to recognize that plaintiffs --
4 there's some substantive advocacy here just beyond
5 the procedural point that we're address, because
6 plaintiffs want to take the position that -- that
7 -- and are in this discussion, taking the position
8 that all these national studies apply with complete
9 force and validity to West Virginia.

10 We don't take that position at all. We
11 think that there are important aspects, important
12 facts and variables specific to West Virginia and
13 specific to Cabell and Huntington that have to be
14 addressed, and I did not understand at all your
15 ruling to be that if Mr. Hester asks the question,
16 "Is there any difference in your opinion on this
17 study because this case is in West Virginia" and
18 the witness says, "No," that we don't get to
19 further probe the basis for that answer.

20 MR. ARBITBLIT: That's just so
21 disingenuous, Steve. I mean, you were on the
22 deposition. Not one word was mentioned about West
23 Virginia in relation to Vowles, Edlund or Doctor
24 Keyes' prior article, the three that we're talking

1 about, and so it's -- it's making up a reason after
2 the fact.

3 There was no discussion of West
4 Virginia in relation to those articles because
5 there -- their discussions of whether opioids lead
6 to misuse, opioid use disorder and how much of a
7 dose and duration will lead to what levels of
8 opioid use disorder, which are the same for people
9 whether they're in West Virginia, Montana, Ohio,
10 wherever it happens to be.

11 And to say that their questions should
12 go on about West Virginia ignores what just
13 happened. These are not West Virginia-specific.
14 To the extent there's West Virginia-specific
15 material - which is extensive - in the witness'
16 report, why not ask your questions about that?

17 SPECIAL MASTER WILKES: Well, they get
18 to ask their questions -- they get to ask their
19 questions and use their allotted time the way they
20 want, like I -- like I said earlier.

21 If they choose to use it in a way
22 that's not advantageous to them, then let them fall
23 on their sword. You're gonna be there for seven
24 hours no matter what. I don't care -- you know, we

1 -- we know that's what's going to take place, so I
2 have to give them some leeway as to ask questions
3 they want, and if it is specific as to West
4 Virginia and they want to -- they want to know why
5 it is or is not applicable to West Virginia,
6 they're entitled to ask that, that side of it.

7 That's, I think, what Mr. Ruby is
8 saying, and I have to agree with him there. But
9 what I -- what I won't allow is inquiry in regards
10 to that which has previously been testified to on
11 -- on a defendant. But once it's -- once the that
12 threshold that it's not applicable to West Virginia
13 or why isn't it, then that's where the questioning
14 has to stop -- or it is and why is it.

15 Call it foundational or call it
16 subsequent questioning -- you know, this report has
17 -- the premise of this report is X. "Is it
18 applicable to West Virginia?"

19 "Yes."

20 "Well, why is this applicable to
21 Cabell/Huntington"? You know, or "The premise of
22 this report is Y, is it applicable to West
23 Virginia?"

24 "No."

1 "Well, then why isn't it applicable to
2 West Virginia?"

3 And then I think they're entitled to
4 make that inquiry. Because --

5 MR.ARBITBLIT: I agree with Your
6 Honor. I agree. I wasn't challenging that aspect.
7 I just don't want a substantive reexamination of
8 the witness on the details or cherry-picked quotes
9 from articles that have been the subject of prior
10 inquiry before we get to the jurisdictional
11 question, and that's --

12 That's what I think is improper. I
13 think -- I agree with you if the -- if the witness
14 says "It does apply for the same reasons as
15 previously stated" or "It doesn't apply and here's
16 why," let them ask those questions.

17 But what's improper is going through -
18 as they've done so far - the substance of the
19 articles that have been the subject of prior
20 inquiry and eliciting new testimony on things that
21 have been inquired about before without any
22 reference at all to West Virginia in the questions
23 or the answers.

24 SPECIAL MASTER WILKES: Well, I think

1 it's clear -- I've made clear that, you know, we're
2 not gonna have just duplicative examination of
3 opinion previously tested by deposition. But the
4 application to West Virginia and why or why not it
5 applies is fair game.

6 I don't know how to make it any clearer
7 than that.

8 MR. RUBY: Judge, I -- thank you,
9 Judge. And I don't want to beat a dead horse, but
10 I think -- and I can assure you that we will -- I
11 think I understand what you are saying. I can
12 assure you - and I think I can speak for Mr. Hester
13 in saying - that we will certainly proceed in good
14 faith reliance on the ruling.

15 I think what -- may be one way of
16 expressing what the Court is saying is that there
17 are going to be general attacks on general opinions
18 on which the witness has been previously
19 questioned, but we can discuss those previous
20 general opinions to lay foundation for West
21 Virginia-specific questions and make sure that we
22 have an understanding of what the previous opinion
23 is so that we can ask the West Virginia-specific
24 question and we can make West Virginia-specific

1 attacks or ask probing West Virginia-specific
2 questions to challenge previously-expressed general
3 opinions.

4 Is that all fair to say, Judge?

5 SPECIAL MASTER WILKES: I think so.
6 It's a lot to digest, but I think that is correct,
7 in that -- you know, it ties it into being
8 jurisdictionally-specific in its application in
9 this case in this jurisdiction, yes.

10 And if there's a question, call me. I
11 understand both sides' position on it. I think
12 I've been clear, but if -- you know, I understand
13 there also may be some -- some testing of it that
14 has a -- may have some objectionable sides, and if
15 that's the case, just give me a call.

16 And I think it would be easier to put
17 out the brush fires now that we've put out the main
18 one.

19 MR. HESTER: Thank you, Your Honor.

20 MR. ARBITBLIT: Thank you, Your Honor.

21 MR. RUBY: Thank you, Judge.

22 SPECIAL MASTER WILKES: Uh-huh.

23 Bye-bye.

24 (Phone call with Judge Wilkes ended.)

1 MR. HESTER: Should we take a break?

2 MR. ARBITBLIT: If you need one, take
3 one.

4 MR. HESTER: I know we've had the
5 witness sitting for a while. Can we just take a
6 five-minute break, Don, and then we'll -- let's
7 resume at five past 11:00. Okay?

8 MR. ARBITBLIT: Okay.

9 VIDEO OPERATOR: Going off the record.
10 The time is 10:58 a.m.

11 (A recess was taken after which the
12 proceedings continued as follows:)

13 VIDEO OPERATOR: Now begins Media Unit
14 3 in the deposition of Katherine Keyes. We're back
15 on the record. The time is 11:07 a.m.

16 BY MR. HESTER:

17 Q. Doctor Keyes, before we took -- excused you
18 from the deposition for a while, I had been asking
19 you about the Edlund study, Exhibit 10. Do you
20 have it there in front of you?

21 A. This is Edlund 2014.

22 Q. Yes. Yeah, Exhibit 10.

23 A. Yes.

24 Q. And do the -- do the findings of that study

1 apply to West Virginia, in your view?

2 A. Yes.

3 Q. Okay. Let me ask you to look at Exhibit
4 46, please. And for the record, Exhibit 46 is a
5 paper by Sean McCabe and others, A prospective
6 study of nonmedical use, prescription opioids
7 during adolescence and substance use disorder
8 symptoms in early mid life.

9 KEYES DEPOSITION EXHIBIT NO. 46

10 ("A prospective study of nonmedical
11 use of prescription opioids during
12 adolescence and subsequent use
13 disorder symptoms in early midlife" by
14 McCabe, et al. dated 1-1-19 was marked
15 for identification purposes as Keyes
16 Deposition Exhibit No. 46.)

17 Q. Doctor Keyes, have you seen this study
18 before?

19 A. Yes.

20 Q. And let me ask you to look at page 7 of the
21 document. And under Heading 3.2 - I guess it's the
22 fifth paragraph down - there's a statement,
23 "Adolescents who indicated medical use without a
24 history of NMUPO did not differ from adolescents

1 with no history of medical use of prescription
2 opioids or NMUPO in the odds of AUD, CUD, ODUD and
3 any SUD symptoms."

4 Do you see that sentence?

5 MR. ARBITBLIT: Objection. That's the
6 identical question asked about a non-West Virginia
7 study in a prior deposition. Can you just ask the
8 witness whether opinions on --

9 MR. HESTER: That's my next question,
10 Don. I'm just going to ask her one question, which
11 is whether they apply -- I can't ask her the
12 question unless I can point her to a place that I'm
13 asking her about.

14 MR. ARBITBLIT: Thank you.

15 Q. Do you see that sentence, Doctor Keyes?

16 A. I do.

17 Q. Does that apply to West Virginia, in your
18 view?

19 MR. ARBITBLIT: Objection. Vague.

20 A. Yeah, I -- can I just request a bit more
21 clarification?

22 Q. Yes. Does that -- does that statement
23 apply to West Virginia, in your view?

24 MR. ARBITBLIT: Objection.

1 A. Does the statement apply to West Virginia?
2 I mean, I would -- I would take issue with the
3 statement.

4 Q. Excuse me? I'm sorry. I didn't understand
5 what you said. You said you'd take issue with the
6 statement?

7 A. Well, the -- I believe that the study
8 results generalized West Virginia.

9 Q. Okay. Maybe that's a better way to put it.
10 Do you agree that the findings stated in this
11 sentence generalized to West Virginia?

12 A. Actually, I'm sorry, can I -- I -- can you
13 repeat the question?

14 Q. Yes. Do you agree that the findings stated
15 here generalizes to the population of West
16 Virginia?

17 MR. ARBITBLIT: Object to form.

18 A. Find -- I'm sorry, I'm just having trouble
19 with --

20 Q. -- the word "generalized?" Maybe I can ask
21 it another way. Do you agree that this finding
22 applies to the population of West Virginia?

23 MR. ARBITBLIT: Object to form.

24 A. I don't -- I don't agree with the author's

1 -- as I've stated in other depositions, I don't
2 agree with the author's general description of the
3 results, so I wouldn't want to say that the
4 findings -- that this statement generalizes to West
5 Virginia.

6 Q. You don't agree with the statement, you
7 mean?

8 A. That's correct.

9 Q. Let me ask you to look at Exhibit 9,
10 please. Do you have Exhibit 9 there?

11 A. I do.

12 Q. For the record, Exhibit 9 is a paper
13 written by Nora Volkow and Thomas McLellan, Opioid
14 Abuse and Chronic Pain - Misconceptions and
15 Mitigation Strategies from the New England Journal
16 of Medicine.

17 KEYES DEPOSITION EXHIBIT NO. 9

18 ("Opioid Abuse in Chronic Pain -
19 Misconceptions and Mitigation
20 Strategies" by Volkow and McLellan
21 dated 3-31-16 was marked for
22 identification purposes as Keyes
23 Deposition Exhibit No. 9.)

24 Q. Doctor Keyes, have you seen this document

1 before?

2 A. Yes.

3 Q. And I wanted to point you in the first
4 paragraph under SOURCE OF THE OPIOID EPIDEMIC, I
5 wanted to point you to the third and fourth
6 sentences. It says, "In 2014 alone, U.S. retail
7 pharmacies dispensed 245 million prescriptions for
8 opioid pain relievers," and then it goes on to say,
9 "Of these prescriptions, 65% were for short-term
10 therapy (less than 3 weeks)."

11 Do you see that?

12 A. I do.

13 Q. Do you have an understanding that that
14 percentage, 65 percent of prescriptions for
15 short-term therapy, applies to the West Virginia
16 community?

17 A. I don't have data on that topic.

18 Q. So you don't know one way or the other what
19 the percentage is in West Virginia of prescriptions
20 written for short-term therapy?

21 A. No.

22 Q. Okay. Let me ask you to look at page 22 of
23 your report, please. And in your report, at page
24 22 and elsewhere, you describe the way that

1 exposure leads to diversion of opioid pills. Is
2 that correct?

3 A. Are you referring to a specific sentence or
4 opinion?

5 Q. I was -- I -- let me ask you -- it's the
6 last sentence under -- before heading C on page 22.

7 A. Okay.

8 Q. And there's a reference to "causal
9 relationship between prescription opioid exposure
10 and opioid use disorder." Do you see that?

11 A. Yes.

12 Q. That's what I wanted to ask you about. So
13 when you use the phrase "exposure" there, are you
14 talking about exposure of the community to opioid
15 pills?

16 MR. ARBITBLIT: Objection.

17 A. Can you describe what you mean by
18 "community exposure?"

19 Q. Well, maybe I should put it the other way
20 around. What do you mean when you say
21 "prescription opioid exposure"?

22 A. I am referring to individuals who use
23 prescription opioids.

24 Q. So that means -- that means people who had

1 access to opioids once they were in the community?

2 MR. ARBITBLIT: Objection.

3 A. I don't think I mean anything other than
4 people who take opioids.

5 Q. Okay. And so when you use the phrase
6 "exposure" there, you're referring to pills that
7 have been dispensed into the marketplace and that
8 are available for use?

9 A. No. I mean people who consume opioids.

10 Q. Okay. And so your point is that people who
11 consume opioids, some number of them engage in
12 misuse of opioids? Is that right?

13 MR. ARBITBLIT: Objection.

14 A. I mean that when people consume opioids,
15 there is a risk of opioid use disorder.

16 And opioid use disorder can include
17 misuse.

18 Q. So opioid use disorder can include both
19 misuse or use pursuant to a doctor's prescription?
20 Is that right?

21 A. It depends on which definition in -- which
22 definition of opioid use disorder we're -- what
23 we're referring to.

24 Q. And could you just explain what you mean by

1 that point, which definition of opioid use disorder
2 we're referring to?

3 A. In DSM-V, there was a change in the
4 definition to -- to exclude opioid use disorder
5 diagnoses based on tolerance and withdrawal as sole
6 criteria for diagnosis.

7 So based on DSM-V, those people would
8 -- who presumably could be medical users of opioids
9 would be excluded from the diagnosis.

10 Q. So let me ask you to look at page 6 of your
11 report, please. And I wanted to ask you about
12 Point 5 on this page.

13 A. Okay.

14 Q. Where you say - and it's the first sentence
15 of that Point 5 - "The expansion of non-medical
16 prescription opioid use would not have occurred
17 without the widespread availability of prescription
18 opioids." You see that?

19 A. Yes.

20 Q. And so is the point you're making there
21 that nonmedical use of prescription opioids was
22 expanded because prescription opioids were more
23 widely available in the community?

24 A. I think the point that I'm making there is

1 that the expansion of nonmedical prescription
2 opioid use occurred in part due to the widespread
3 availability based on opioids that were originally
4 dispensed for supposedly medical uses.

5 So I think the statement you made is a
6 little broader than what the opinion is.

7 Q. And is your opinion that there was an
8 oversupply that was diverted to opioid misuse?

9 A. Yes.

10 Q. And so the diversion you're describing is
11 pills that made their way into the community and
12 led to misuse; is that right?

13 A. I would just refer to my definition of
14 diversion that I'm using in the report for
15 specificity, and so my definition of "diversion"
16 includes the transfer of opioids obtained through
17 legal medical sources to the illicit marketplace
18 overall.

19 So I think it's a bit broader than your
20 definition here, which is "pills that made their
21 way into the community and led to misuse." That's
22 more limited.

23 Q. But the pills that made their way into the
24 community and led to misuse, in your view, are

1 often diverted from a medical use to a nonmedical
2 use?

3 A. They can be diverted.

4 Q. And so --

5 A. I would --

6 Q. -- at page -- sorry. Sorry.

7 A. No, I'm finished with my answer.

8 Q. At page 7, if you look at page 7 of your
9 report, Point 12, and it's the last sentence of
10 that point, you say, "The driving force in
11 increasing opioid-related morbidity and mortality
12 was, and continues to be, access to and wide-spread
13 availability to opioids."

14 Is that right? Do you see that?

15 A. I do.

16 Q. So access means access to people in the
17 community after pills have left a pharmacy. Is
18 that right?

19 A. Not necessarily.

20 Q. How does -- how does the community get
21 access to the pills?

22 A. Through a physician, for example.

23 Q. How else would the community have access to
24 pills?

1 A. I'm sorry, I'm -- I don't think I'm
2 understanding the question. Is the question, what
3 are all the sources of opioids?

4 Q. No. Well, I guess what I'm -- what I'm
5 trying to get to is this: When you're talking
6 about access, you're talking about access to pills
7 after they leave pharmacies. Is that right?

8 A. That's one source of opioids.

9 Q. And what are other sources of opioids that
10 get into the community and create this access
11 you're describing?

12 A. I think in my report, I review data
13 specific to that topic and a modal source, for
14 example, is obtaining opioid medications from
15 family, for example. You know, there's a leftover
16 bottle in the medicine cabinet because too many
17 opioids were prescribed and someone gets access to
18 them through their parents' medicine cabinet. That
19 would be one example.

20 Q. And so that example, after too many opioids
21 were prescribed and somebody obtains them from the
22 medicine cabinet, that would be after the pills
23 left the pharmacy?

24 A. That would be after the pills left the

1 pharmacy.

2 Q. Your focus is on diversion of pills after
3 they leave the pharmacy. Is that correct?

4 A. I don't know that I would make that blanket
5 statement.

6 Q. Do you have any evidence of diversion
7 between the time that pills are shipped by
8 distributors and they're delivered to pharmacies?

9 A. I don't -- I don't have -- I don't offer a
10 specific opinion on that topic. That could be the
11 case.

12 Q. The diversion you discuss is diversion of
13 pills after they have left pharmacies. Is that
14 right?

15 MR. ARBITBLIT: Objection.

16 A. The diversion that I discuss is any
17 transfer of opioids to the illicit marketplace.

18 Q. And that -- that's after they've left the
19 pharmacy?

20 MR. ARBITBLIT: Objection.

21 A. It could be after they leave the pharmacy.
22 I'm not -- I'm not exclusively limiting my opinion
23 to -- on the harms of opioids to opioids that leave
24 the pharmacy.

1 Q. There could also be opioids there illegally
2 trafficked into a community?

3 A. Sure. Yes.

4 Q. That never leave the pharmacy at all,
5 right?

6 A. That's possible.

7 Q. But what I wanted to be clear on is:
8 You're not offering an opinion on diversion of
9 pills between the time a distributor ships them and
10 delivers them to a pharmacy, are you?

11 A. My definition of "diversion" would include
12 that type of activity.

13 Q. Do you have any evidence of that occurring
14 in Cabell/Huntington?

15 A. I -- my report focuses on opioid-related
16 harms overall. I don't offer an opinion on any
17 specific -- any specific -- what is it? Illegal
18 shipments of opioids.

19 Q. And you're not offering any opinions on the
20 diversion of shipments between the time they leave
21 a distributor's warehouse and the time they arrive
22 at a pharmacy?

23 A. My opinion on diversion would be inclusive
24 of that type of activity.

1 Q. But you don't have any evidence of that
2 activity occurring, do you, in Cabell/Huntington?

3 A. I think my report offers evidence about
4 overall sources of opioids that would be inclusive
5 of any illegal -- any way that opioids are
6 illegally-obtained.

7 I don't offer any opinions or have
8 evidence about specific illegal shipments. But to
9 the extent that that occurs, that would be included
10 in my report on harms.

11 Q. Right. But I wanted to just be clear that
12 -- and I think we're talking the same language
13 here. I want to be clear that you're not
14 identifying any sources of diversion in relation to
15 shipments between distributors and pharmacies?

16 You haven't identified any such
17 evidence?

18 A. Right.

19 Q. And when you talk about -- let's look at
20 your report, page 27. And I wanted to point you to
21 the last paragraph before Subpart E. And you refer
22 to "a surplus of opioids that could be diverted for
23 nonmedical uses." Do you see that? Sort of in the
24 middle of that paragraph.

1 A. I do.

2 Q. And that's a -- that's a surplus that is in
3 the community after it's left the -- after it's
4 left pharmacies; is that right?

5 A. Not necessarily.

6 Q. Are you aware of any surplus that's created
7 except after the pills leave pharmacies?

8 A. I'm not identifying any particular
9 shipments. But any -- any surplus that occurred in
10 the community would be a surplus regardless of
11 where the surplus originated.

12 Q. I believe you've expressed the opinion in
13 your report that diversion between family and
14 friends is the most common pathway for diversion.
15 Is that right?

16 A. It is a common pathway.

17 Q. And do you agree that distributors do not
18 have a way to prevent family members from sharing
19 pills once they receive them?

20 A. I wouldn't agree with that as a blanket
21 statement.

22 Q. How would distributors prevent family
23 members from sharing pills once they receive them?

24 A. I can't identify any particular ways of --

1 that distributors would do that, but I -- I'm not
2 aware -- I don't offer an opinion either way. I
3 just wouldn't make the blanket statement that
4 distributors can and cannot prevent any activity.

5 Q. You understand that prescription opioids
6 can't leave a pharmacy unless the doctor writes a
7 prescription?

8 A. There are other ways that opioids could
9 leave a pharmacy.

10 Q. Are you thinking of theft from the
11 pharmacy?

12 A. For example.

13 Q. What other ways?

14 A. Other sources of diversion, you know,
15 selling, illegal selling, for example.

16 Q. So I -- just to be clear, the -- when pills
17 are at a pharmacy, one way pills leave the pharmacy
18 and reach the community is through prescriptions
19 written by doctors, right?

20 A. That's correct.

21 Q. Another way is if pills were sold illegally
22 out of a pharmacy; is that right?

23 A. That is another way, yes.

24 Q. And another way would be theft from

1 pharmacies?

2 A. That's another way.

3 Q. Are there others that occur to you that --
4 ways that pills leave pharmacies and get into the
5 community?

6 A. None come to mind.

7 Q. And do you have any evidence of any theft
8 from pharmacies occurring in Cabell/Huntington?

9 A. I haven't reviewed that type of data for
10 this report.

11 Q. And do you have any evidence of pills being
12 sold illegally from pharmacies in
13 Cabell/Huntington?

14 A. Again, I'm -- I haven't reviewed that
15 evidence.

16 Q. You agree that -- that doctors decide on
17 the prescriptions that they believe are warranted
18 for the treatment of pain?

19 A. I wouldn't make that as a blanket
20 statement.

21 Q. Do you have an understanding that when a
22 doctor writes a prescription for a medical purpose
23 for prescription opioids, the doctor's exercising
24 his or her judgment that the medical use is

1 warranted?

2 MR. ARBITBLIT: Objection.

3 A. The doctor's judgment is based on the
4 information that's available. So in some cases,
5 the doctor is using their -- the judgment that they
6 have based on potentially misleading information,
7 and also there are doctors that prescribe with no
8 medical purpose at all.

9 Q. So for -- but for doctors who are
10 prescribing for medical purpose, they're making a
11 judgment that the prescription opioids are
12 warranted for that purpose. That's your
13 understanding?

14 MR. ARBITBLIT: Objection.

15 A. I wouldn't say that's a -- that's true
16 across the board. It can be true, but I wouldn't
17 say that that's always true.

18 Q. They -- you think that doctors are not
19 making medical judgments when they write a
20 prescription for opioids?

21 MR. ARBITBLIT: Objection.

22 A. I think some doctors prescribe with --
23 without medical judgment, and I think the opinion
24 that I'm offering is that -- I think that's the

1 opinion that I'm offering, that there are -- I
2 wouldn't make a blanket statement about all types
3 of judgments that physicians use when they're
4 prescribing opioids.

5 Those judgments are oftentimes based on
6 misleading information.

7 Q. I was -- I was trying to separate the
8 information that the doctor has from the good faith
9 judgment that the doctor is making. Is it your
10 understanding that when a doctor writes a
11 prescription, the doctor is undertaking to make a
12 good faith judgment that the prescription is
13 warranted?

14 MR. ARBITBLIT: Objection.

15 A. Some doctors are; and some are not. So I
16 can't make a blanket statement about that.

17 Q. Do you know the percentage of doctors that
18 are or are not making a good faith judgment when
19 they write prescriptions?

20 A. Yes, there's a section in my report on that
21 topic.

22 Q. Where? Can you easily find that?

23 A. Section C.

24 Q. What page are you on?

1 A. Page 24. I think there's a couple
2 different data sources that I would use to inform
3 an opinion about that. One is that among people
4 with OUD, more than 50 percent obtain prescriptions
5 from a doctor.

6 And second, there are numerous data
7 sources on multiple providers that could be
8 recklessly prescribing, and there's data on
9 prevalence of that. So I would point to those
10 papers.

11 Q. So that the people with OUD who obtain
12 prescriptions from doctors, those are not
13 necessarily people who are receiving a prescription
14 written by a doctor in bad faith, are they?

15 MR. ARBITBLIT: Objection.

16 A. Not necessarily.

17 Q. But in any event, the pills can't leave the
18 pharmacy under a prescription unless the doctor
19 writes one. Correct?

20 A. Again, I don't -- I don't think I would
21 make that blanket statement. There could be other
22 ways that people with a prescription could obtain
23 opioids. One way is someone has a prescription and
24 they walk into a pharmacy and they fill it. There

1 are other ways as well.

2 Q. Do you understand that distributors shipped
3 the volumes of prescription opioids that were
4 needed to meet the levels that doctors prescribed?

5 MR. ARBITBLIT: Objection.

6 A. I wouldn't make that blanket statement. I
7 wouldn't agree with that statement as a blanket
8 statement.

9 Q. Do you -- do you have any evidence that
10 distributors shipped more than what doctors
11 prescribed?

12 A. I'm not offering an opinion on specific
13 shipments. I know the overall amount that was
14 shipped was more than was needed.

15 Q. No, I'm not asking about what was needed.
16 I'm asking about whether doctors -- I'm sorry.

17 MR. HESTER: Let me strike that.

18 Q. I'm asking whether distributors shipped
19 more than what doctors prescribed. Do you have an
20 understanding that distributors only shipped what
21 doctors prescribed?

22 A. I have an understanding generally of -- of
23 the distribution process, but I'm not offering an
24 opinion about -- about the relationship between

1 prescription and distribution specifically.

2 Q. Okay. At the -- at the --

3 MR. HESTER: Let me strike -- sorry.
4 Let me strike that.

5 Q. Let's turn to page 6 of your report,
6 please. And it -- I wanted to point you to
7 Paragraph 5. You refer to a "widespread
8 availability of prescription opioids that were
9 originally dispensed supposedly" "for medical uses,
10 uses, often in greater quantities and doses than
11 needed."

12 Do you see that?

13 A. Well, just to quote it accurately, it's
14 "originally dispensed supposedly (but not always
15 actually) for medical uses." Just to --

16 Q. Fair enough. Fair enough. I omitted that
17 because I didn't want to ask you about that part; I
18 wanted to ask you about another part, which was:
19 How do you decide on what is a surplus or an
20 oversupply?

21 A. My opinion about that was based on the
22 epidemiological literature that indicated that
23 there's often more opioids dispensed than are
24 medically needed.

1 Q. And that's dispensed from pharmacies?

2 A. Again, that's one source of oversupply.

3 Q. But when you say -- when you say "more
4 opioids dispensed than what is needed," you're
5 saying more opioids dispensed from pharmacies than
6 was needed?

7 A. That specific clause refers to that -- that
8 realm.

9 Q. And --

10 A. But there are others.

11 Q. Sorry. And the -- what methodology you're
12 -- is applicable there? You're relying on
13 epidemiological studies on that?

14 A. That's correct.

15 Q. And can you -- can you point me to where
16 you're doing that in your report? I think maybe it
17 could be at page 23. See if we get to the right
18 place.

19 A. Yes, that's correct.

20 Q. And so what are the -- what are the
21 epidemiological studies that you're referring to
22 there?

23 A. So for example, "Available estimates
24 indicate that 90% of patients prescribed opioids

1 after a surgery have unused medication." That
2 would are one -- and there are three studies
3 supporting that.

4 Q. So that would be -- that would be an
5 example where a doctor prescribed prescription
6 opioids and there were unused opioids left after
7 the course of treatment? Is that right?

8 A. That's right.

9 Q. And is there anything else you're relying
10 on aside from those epidemiological studies to make
11 a conclusion about what was a surplus or an
12 oversupply?

13 A. Yes.

14 Q. What else?

15 A. So the next study that is described in this
16 section is on nonmedical opioid users being
17 interviewed about where they obtained opioids. For
18 example, 50% "received from a friend or a
19 relative." That's not necessarily a pharmacy
20 source, but could be.

21 And then the next section is peers or
22 family, the most common source of opioids for
23 college students, and there's two studies cited
24 there.

1 And again, that's not necessarily a
2 pharmacy source. But it could be.

3 Then the next one is a study that
4 showed that opioid dispensing to family members is
5 associated with three times the risk of a
6 prospective individual hospitalized overdose. And
7 so those presumably would be pharmacy sources.

8 And then the next section goes into
9 detail about individuals receiving opioids from
10 multiple prescribers and high-volume prescribers.

11 Q. So -- okay. So when you're saying that
12 there's a surplus or an oversupply, do you base
13 that on the fact that there's excess medication
14 that family and friends have available to divert to
15 others? Is that the basis on which you
16 characterize it as an oversupply?

17 A. That's one source of oversupply.

18 Q. I'm trying to get at the question of how
19 you conclude it's an oversupply. How do you -- how
20 do you decide that it's an oversupply?

21 A. So based on the totality of the literature,
22 that there is a lot of excess opioids that were not
23 used medical -- not needed medically. So that
24 includes --

1 Q. And --

2 A. -- family, friends. That includes
3 prescriptions. That includes other sources of
4 diversion.

5 Q. Have you evaluated the medical needs for
6 prescription opioids in West Virginia?

7 A. Can you say what you mean by "medical
8 needs"?

9 Q. Well, do you agree that there are
10 legitimate medical needs for opioids?

11 MR. ARBITBLIT: Objection.

12 A. I think that -- sure, there are -- there
13 are uses for opioids, and there are uses for
14 opioids in the Cabell/Huntington community. But I
15 think what the evidence shows is that there was --
16 the distribution of opioids into the
17 Cabell/Huntington community is clearly well over
18 what is needed.

19 Q. But let me -- let me then just drill into
20 that question. Have you undertaken any study to
21 evaluate what level of opioids are needed in the
22 Cabell/Huntington community?

23 A. There is literature on -- on guidance
24 regarding opioid prescribing that is relatively up

1 to date, and so I would rely on that guidance to
2 answer that question.

3 I have not applied current high rigor
4 guidance specifically to the Cabell/Huntington
5 community.

6 Q. So you've not undertaken any evaluation of
7 how many pills are needed in Cabell/Huntington?

8 MR. ARBITBLIT: Objection.

9 A. I -- no, I have not taken -- I've not
10 undertaken that.

11 Q. And the guidance you referred to, is that
12 the CDC guidance on prescription opioid
13 prescribing?

14 A. That's one source.

15 Q. What other guidance are you referring to?

16 A. There's been a number of other guidance
17 sources that I cited in the report.

18 Q. Okay. So I may circle back to that.
19 You're not an expert in pain management, I take it?

20 MR. ARBITBLIT: Objection.

21 A. I think part of having epidemiological
22 expertise on opioid use disorder is a general
23 knowledge of that literature.

24 Q. But you don't treat patients for pain?

1 A. I don't treat patients for pain.

2 Q. And have you evaluated the medical need for
3 opioids in West Virginia?

4 A. I've generally evaluated medical needs for
5 opioids, and I would say that those findings
6 generalize to West Virginia.

7 Q. And what have you done to evaluate the
8 medical needs for opioids?

9 A. I've reviewed literature.

10 Q. What literature have you seen evaluating
11 the medical needs for opioids?

12 A. I think there's a number of studies that
13 have discussed appropriate uses of opioids.

14 Q. Yeah, but I'm talking about -- well, maybe
15 let's back up to make sure we're on the same page.
16 The overall supply of opioids in the community
17 reflects an aggregation of judgments by doctors
18 about what's medically needed, right?

19 MR. ARBITBLIT: Objection.

20 A. I wouldn't make that blanket statement.

21 Q. Well, let's focus on prescriptions written
22 by doctors for legitimate medical need. The
23 prescriptions written by doctors for medical -- for
24 legitimate medical need, those would aggregated to

1 a judgment by doctors about the medical need.

2 Correct?

3 MR. ARBITBLIT: Objection.

4 A. I don't think that most doctors -
5 especially during this time period - had sufficient
6 guidance on what is a legitimate medical need in
7 order to suggest that -- that the entire supply of
8 opioids to the Cabell/Huntington community that is
9 written by doctors would be based on legitimate
10 medical need.

11 Q. But doctors make that judgment about what's
12 needed?

13 MR. ARBITBLIT: Objection.

14 A. Do doctors make a judgment about what's
15 needed? I think some doctors make judgments in
16 good faith; other doctors do not.

17 Q. But for those judgments who make -- I'm
18 sorry.

19 MR. HESTER: Strike that.

20 Q. For those doctors who make judgments in
21 good faith, they're making judgments about what
22 they believe is medically needed. Right?

23 MR. ARBITBLIT: Objection.

24 A. They are making judgments based on a set of

1 evidence that might be tainted by not sufficient
2 rigor. They might not be up to date on current
3 trainings. I mean, to suggest that all doctors
4 were writing prescriptions in good faith or making
5 medically-legitimate decisions, I think would be a
6 mischaracterization of what we've seen in the
7 opioid epidemic.

8 Q. You have not evaluated, though, what the
9 level of medical need is in West Virginia?

10 MR. ARBITBLIT: Objection, asked and
11 answered.

12 A. I have evaluated literature about medical
13 uses of opioids and I believe that those findings
14 are generalized to West Virginia.

15 Q. I think there's a difference though. Your
16 answer referred to medical uses. I'm talking about
17 the aggregate medical need, and what I wanted to
18 ask you about is -- is any literature dealing with
19 the aggregate medical need for opioids. Have you
20 evaluated that question?

21 MR. ARBITBLIT: Objection.

22 A. No.

23 Q. When you refer to quantities and doses at
24 page 6 of your report, you refer to "prescription

1 opioids that were" "dispensed" "in greater
2 quantities and doses than needed." Do you see
3 that? It's again on -- that Point 5 on page 6.

4 A. Yes.

5 Q. The doctors are the ones who decide on a
6 quantity and dose for a given prescription, right?

7 MR. ARBITBLIT: Objection.

8 A. In this specific context. In this specific
9 opinion. I'm specifically referring to "dispensed"
10 opioids in "quantities and doses greater than
11 needed." And in that case, the physician would be
12 writing a prescription, in most cases. Although
13 not necessarily all.

14 Q. But the prescription -- the prescription
15 with the quantity and the dose, that's something
16 that the doctor decides on?

17 MR. ARBITBLIT: Objection.

18 A. When there is a prescription written by a
19 doctor.

20 Q. And the distributors don't decide on the
21 quantity and dose for particular prescriptions,
22 right?

23 A. Distributors don't write prescriptions,
24 that's correct.

1 Q. Do you agree or understand that the
2 expansion of nonmedical use of prescription opioids
3 would not have occurred without the increase in
4 supply caused by doctors' prescriptions?

5 A. I agree that that is one source of the
6 increase in supply.

7 Q. And we've talked about some of the other
8 sources of increased supply as well, right?

9 A. We've talked about some of them.

10 Q. What are -- what are the other sources you
11 have in mind, aside from doctor prescribing? What
12 are the other sources for increases in supply?

13 A. Your question is: What are the sources of
14 prescription opioid supply?

15 Q. Yes. You said one source is doctors'
16 prescriptions. What are other sources?

17 A. I think the amount of product that is made
18 and distributed in the United States that could be
19 diverted at any point along the chain from the
20 making of the product to it arriving in a
21 community.

22 Q. Well, let's -- maybe let's focus more
23 specifically so we don't make it too cosmic. Let's
24 focus specifically on Huntington/Cabell. I take it

1 you do have evidence of prescribing behavior in
2 Huntington/Cabell that led to an increase in supply
3 of prescription opioids?

4 MR. ARBITBLIT: Object to form.

5 A. I have evidence of the distribution of
6 prescription opioids in the Cabell/Huntington
7 community.

8 Q. You have evidence of an increase in supply
9 that was caused by doctor prescribing behavior,
10 correct?

11 A. I have evidence of the distribution. Some
12 of that could have arrived -- become disseminated
13 into the community through a prescription, and
14 there might be other sources as well.

15 Q. Well, that's what I want to focus on, ways,
16 to your understand, that prescription opioids were
17 disseminated into the Huntington/Cabell community.
18 One way, I take it, is by prescriptions written by
19 doctors. Right?

20 A. Yes.

21 Q. What other ways are you aware of that
22 prescription -- that prescription opioid supply
23 increased in Huntington/Cabell into the community?

24 A. I don't -- I think I've answered the

1 question. I'm not sure -- what are other ways that
2 -- so you're asking one way that prescription
3 opioids be -- get into a community is because a
4 doctor writes a prescription for them?

5 Q. Right.

6 A. Other ways are through other sources of
7 diversion that we've mentioned: You know, family,
8 friend, peer, drug dealer, you know, anyone who has
9 access to opioids through the way that they access
10 them.

11 Maybe through informal social networks
12 of sharing medication. Maybe it was through
13 counterfeit medication. I mean, there's other ways
14 that prescription opioids can be in a community.

15 Q. The -- but your view is that the expansion
16 of nonmedical use would not have occurred without
17 an increase in the supply of prescription opioids
18 in the community?

19 MR. ARBITBLIT: Objection.

20 A. That's correct.

21 Q. Have you performed any analysis as to
22 whether the opioid crisis would have occurred or
23 occurred in the same way if doctors had not
24 increased their prescribing of prescription

1 opioids?

2 MR. ARBITBLIT: Asked and answered.

3 A. Yes, I think there is literature on that
4 topic, that doctors writing prescriptions is one
5 way that contributed to the opioid crisis.

6 Q. Yeah, I was asking really the other side of
7 it. I was asking, have you done an analysis as to
8 whether the opioid epidemic would have occurred in
9 the same way if doctors had not increased their
10 level of prescribing?

11 MR. ARBITBLIT: Objection.

12 A. I think that it would not have occurred in
13 the same way if doctors had not increased their
14 prescribing, based on the studies that were done.
15 So I think my analysis is the review of the
16 literature, and I think the opioid epidemic would
17 not have occurred in the same way if doctors had
18 not increased their level of prescribing.

19 Q. We talked a minute ago about the
20 prescribing beyond recommended guidelines, and let
21 me point you to Exhibit 4. I don't think we've
22 opened that up yet.

23 KEYES DEPOSITION EXHIBIT NO. 4

24 (CDC Guideline for Prescribing Opioids

1 for Chronic Pain - United States, 2016
2 was marked for identification purposes
3 as Keyes Deposition Exhibit No. 4.)

4 Q. Do you have that one there?

5 A. I do.

6 Q. So Exhibit 4 is the CDC Guideline for
7 Prescribing Opioids for Chronic Pain - United
8 States, 2016.

9 Are these the guidelines you are
10 referring to when you said you saw evidence of
11 prescribing beyond guidelines?

12 A. One set of guidelines. There are --

13 Q. There are -- sorry. Are there others you
14 had in mind?

15 A. I believe there are several others that are
16 cited in my report.

17 Q. Can you point me to those? I couldn't
18 figure out when I saw a reference to guidelines, I
19 wasn't sure what you were referring to.

20 A. I'm sorry, I'm just looking through my
21 reference list. I believe that there are other
22 guidelines that have been published, for example,
23 by NIDA.

24 Q. Are those cited in your report?

1 A. I think so, but I could double-check.

2 Q. Any other guidelines that you had in mind?

3 A. I believe that the Association of Schools
4 and Programs of Public Health published in 2019
5 also has prescribing guidelines in it. That's
6 Reference 45.

7 Q. Okay. Thank you. Let's just look at the
8 CDC Guidelines for a minute, Exhibit 4. Is it your
9 understanding that these guidelines are not meant
10 to prevent physicians from prescribing in excess of
11 the guidelines?

12 MR. ARBITBLIT: Objection.

13 A. Can you rephrase? I don't think I
14 understand the question.

15 Q. Do you have an understanding that these
16 guidelines were intended to set recommendations but
17 not to prevent prescribing in excess of the
18 guidelines?

19 MR. ARBITBLIT: Objection.

20 A. My understanding is that these guidelines
21 do not prevent prescribing in excess of them.

22 Q. And that's reflected -- I -- I'm not trying
23 to play a game with you on that. I think that's
24 reflected - but let me see if you agree - on page

1 2. The -- in the right-hand column of page 2,
2 before Rationale, there's a statement three
3 sentences up. It says, "The recommendations in the
4 guideline are voluntary, rather than prescriptive
5 standards."

6 Do you see that?

7 A. I see that.

8 Q. And so that reflects the point that these
9 were meant to be voluntary -- voluntary
10 recommendations and not to prevent doctors from
11 prescribing in excess when they believe that was
12 medically warranted?

13 A. I think the guidelines do not prevent
14 people from prescribing excessive amounts of
15 opioids.

16 Q. And it was left to doctors to decide on the
17 risks and the benefits of what they would
18 prescribe?

19 MR. ARBITBLIT: Objection.

20 A. I think -- I think the guidelines don't
21 prevent doctors from prescribing levels of opioids
22 beyond that which is recommended. Whether they're
23 prescribing those above the level that are
24 recommended, what are -- what is driving those

1 decisions, I'm -- I don't think risks and benefits
2 are among the only factors.

3 Q. Correct.

4 A. They also have to take into account the
5 information they've been given.

6 Q. And -- but those -- those risks and
7 benefits are weighed by doctors and not
8 distributors. Correct?

9 MR. ARBITBLIT: Objection.

10 A. I think that a doctor's knowledge of the
11 risks and benefits are based on the information
12 that they've been given. I don't think
13 distributors prescribe opioids. But I don't think
14 it would be accurate to say that the distributors
15 don't have a role here.

16 Q. The doctors formulate their judgments about
17 the risks and benefits of medicines based on a wide
18 range of inputs. Do you agree?

19 MR. ARBITBLIT: Objection.

20 A. It would depend on the medication. I
21 wouldn't make a blanket statement.

22 Q. Do you understand that doctors form
23 judgments about particular -- prescribing of
24 particular medicines based on their clinical

1 experience with other patients?

2 A. I think that can be one source of
3 information, among others.

4 Q. Another source would be whatever they're
5 taught in medical school?

6 A. Again, I think that can be a source of
7 information, and it would depend on how the
8 information that's being taught in medical school
9 was derived. Not derived de novo, as I've
10 testified before.

11 Q. Let me ask you to look at your report, page
12 22. At the bottom of the page, the very last
13 sentence, you refer to "pervasive oversupply from
14 high volume facilities."

15 Do you see that?

16 A. I do. "...facilities and pharmacies
17 distributing extraordinary quantities of opioids."

18 Q. Right, right, okay, good. What do you mean
19 there by "high volume"?

20 A. That has been defined in the literature.
21 Let's see. I just want to make sure that I'm
22 giving the correct -- I think I would need to go to
23 these specific studies to know exactly how most of
24 the literature defines it.

1 I mean, generally it's a very high
2 quantity of opioids. But the specific number
3 that's used, I would need to look at the studies
4 again to know that for sure.

5 Q. What's the basis for your knowledge about
6 high volume facilities? Is it based on a review of
7 the literature?

8 A. Yes.

9 Q. Have you done any independent study
10 yourself of what a high volume facility is?

11 A. No.

12 MR. ARBITBLIT: Objection.

13 A. I've reviewed the literature. That -- the
14 analysis that I've done is a review of the
15 literature.

16 Q. Have you evaluated any high volume
17 facilities in Cabell/Huntington?

18 A. Yes. That's included in here through the
19 IQVIA data in terms of what's been published in the
20 literature.

21 Q. Do you know what page you're on when you
22 refer to that?

23 A. 25. I'm fairly clear that -- I'm fairly
24 certain that those rates have been published.

1 Q. So I see on page 25, you're referring to
2 prescribers with a high volume or extraordinary
3 volume of prescriptions. I was asking about high
4 volume facilities.

5 Do you -- is that synonymous for you,
6 or is it -- is there a difference between a high
7 volume facility and a high volume prescriber?

8 A. Those would be the -- it depends. They can
9 be similar; they can be different.

10 Q. So if a high volume --

11 A. The literature --

12 Q. Sorry.

13 A. -- when they talk about high volume
14 providers, those are often referred to as pill
15 mills, and so within a specific high volume
16 facility, there might be -- the high volume
17 facility would be made up of high volume
18 prescribers.

19 Q. But a high volume facility -- just to make
20 sure we're talking the same language, a high volume
21 facility could include a pain clinic?

22 MR. ARBITBLIT: Objection.

23 Q. Is that one of the ways -- one of the types
24 of facilities you might consider a high volume

1 facility?

2 MR. ARBITBLIT: Objection.

3 A. Sorry, let me just look at the -- what do
4 you mean by a "pain clinic?"

5 Q. Well, do you know what pain clinics are?

6 MR. ARBITBLIT: Objection.

7 Q. In other words, a clinic that is
8 specifically focused on treating pain. Are you
9 aware of those?

10 A. I'm aware that there are clinics that focus
11 on -- on -- that supposedly focus on the treatment
12 of pain.

13 Q. And --

14 A. -- under many conditions.

15 Q. Sorry. I didn't mean to interrupt you.
16 Have you evaluated any pain clinics in
17 Cabell/Huntington?

18 MR. ARBITBLIT: Objection.

19 A. I've evaluated the overall distribution of
20 opioids. I don't know that I would -- I haven't
21 evaluated any specific clinics.

22 I've looked at high volume prescribers
23 and high volume prescribing.

24 Q. You're aware that doctors today are still

1 prescribing in West Virginia a meaningful volume of
2 prescription opioids, right?

3 A. Yes.

4 Q. And to -- do you have an understanding as
5 to whether doctors in West Virginia today have been
6 apprised of the addiction risks of prescription
7 opioids?

8 MR. ARBITBLIT: Objection.

9 A. I don't know what any one particular doctor
10 has been informed of.

11 Q. Do you believe the population of doctors in
12 West Virginia have been informed of the addiction
13 risks associated with opioids?

14 MR. ARBITBLIT: Objection.

15 A. I don't have any data on that topic.

16 Q. So you don't have an understanding one way
17 or the other as to whether doctors in West Virginia
18 have been apprised of the addiction risks of
19 opioids?

20 A. That's correct.

21 Q. Have you undertaken any evaluation of the
22 standard of care for treating pain?

23 A. I have reviewed guidelines that have been
24 published in the literature on pain.

1 Q. Is that the CDC guidelines or other things
2 you're thinking of?

3 A. The same documents that I had mentioned in
4 our previous conversation.

5 Q. Okay.

6 A. Well, there's other literature as well
7 cited in the report about pain treatment efficacy.

8 Q. And have you undertaken any analysis of
9 pain needs specifically in Cabell/Huntington
10 community?

11 MR. ARBITBLIT: Objection. Asked and
12 answered.

13 A. No.

14 Q. And have you undertaken any specific
15 evaluation of pain needs in West Virginia?

16 A. I would only say to the extent that, you
17 know, the available literature has characterized
18 overall levels of pain that I would say generalized
19 to that area. But beyond review of the general
20 literature, I have not done any specific analysis
21 of West Virginia.

22 Q. And is the literature you're thinking of
23 literature that evaluates the standard of pain in
24 West Virginia, or is it really more nationwide?

1 A. I would say that it's more general.

2 Q. And have you seen any studies reflecting
3 that there may be higher pain needs in West
4 Virginia?

5 A. I seen some literature on that.

6 Q. And do you have an understanding that one
7 of the factors that may lead to higher needs for
8 pain treatment in West Virginia is the nature of
9 the physical work engaged in in the state?

10 A. Yes, I've seen literature on that.

11 Q. And do you have an understanding as well
12 that the higher levels of obesity in West Virginia
13 may be another factor that leads to higher needs
14 for pain treatment in the state?

15 A. That -- that could lead to pain, yes.

16 Q. And you've seen studies or documents to
17 that effect?

18 A. Generally, yes.

19 Q. Are -- we've talked about obesity and
20 physical labor. Are there other factors you've
21 seen that are specific to West Virginia that may
22 lead to higher needs for pain treatment?

23 A. I would need to review the literature
24 again. Nothing comes to mind.

1 Q. Nothing comes to mind?

2 A. (Nodded affirmatively).

3 Q. Have you evaluated the changes in the
4 standard of care for the treatment of pain?

5 A. I'm generally familiar with the fact that
6 there have been changes. But I didn't -- I didn't
7 review that literature in order to form opinions of
8 it. I'm just generally aware of it.

9 Q. And what's your general understanding of
10 the changes in the standard of care for the
11 treatment of pain?

12 A. I think the most recent changes, is that
13 there has been widespread recognition that opioid
14 prescribing has too many risks and too many
15 benefits to be -- to be of use in widespread
16 treatment of pain.

17 Q. You're talking there about chronic pain or
18 acute pain?

19 A. I think both.

20 Q. Do you believe that opioids are widely used
21 for the treatment of acute pain?

22 A. I think that there is literature to that
23 effect.

24 Q. I wanted to focus really on -- on the

1 treatment of pain as a concept. You're aware that
2 there have been changes in the standard for the
3 treatment of pain.

4 MR. ARBITBLIT: Objection.

5 A. I guess I'm not sure what you mean by "pain
6 as a concept."

7 Q. Well, you understand there's a -- there's a
8 focus on the need to enhance the treatment of pain.
9 This has been a focus in the medical community?

10 MR. ARBITBLIT: Objection.

11 A. I think that there -- I have seen
12 literature on -- for example, pain as the fifth
13 vital sign, that is largely industry-supported. So
14 to the extent that there is a general feeling in
15 the medical community that hasn't been influenced
16 by industry, I'm not sure about that.

17 And certainly not in recent years.

18 Q. So you don't have -- beyond what you just
19 said, do you have any further information or
20 understanding on the changes in standard of care
21 for the treatment of pain?

22 MR. ARBITBLIT: Objection.

23 A. I -- if you have specific questions, I
24 could answer them. But in terms of general

1 understanding, I'm generally familiar about that
2 there have been changes.

3 Q. Have you evaluated any statements that were
4 made by the state of West Virginia government about
5 the use of opioids for the treatment of pain?

6 A. No.

7 Oh, actually, I have reviewed. I think
8 in the course of writing my report, I have reviewed
9 State Department of Health and other governmental
10 body reports, and some of those might have had
11 statements.

12 And so I might have reviewed some of
13 that material.

14 Q. Is that -- is that something you factored
15 into your opinions, the statements made by the West
16 Virginia government on the use of opioids in the
17 treatment of pain?

18 A. I factored it in. I evaluated it, the
19 materials that I reviewed.

20 Q. So when you speak about appropriate levels
21 of prescription opioids in West Virginia, have you
22 evaluated the standards of care in making those
23 statements?

24 A. I have evaluated the general literature on

1 opioid risks and benefits when forming my opinions.
2 And so if you have a specific standard of care in
3 mind, I could see how it comports with my opinions.

4 Q. Do you have an understanding that there was
5 an increase in the desire to treat pain in this
6 country?

7 MR. ARBITBLIT: Objection.

8 A. I would say that's a little bit too vague
9 for me to agree or disagree with.

10 Q. The -- how did the standard of care for the
11 treatment of pain factor into your evaluation of
12 the excess supply of prescription opioids?

13 A. I would say in general, I evaluated -- as I
14 said, I evaluated the literature, the medical
15 literature, on risks and benefits when forming my
16 opinion.

17 And so -- and so that's what formed my
18 opinion. Rather than any particular standard.

19 Q. Let me ask you -- I know you were
20 questioned previously in other depositions about
21 the DEA annual production quotas. Do you remember
22 that?

23 A. I do.

24 Q. And is it your understanding that the

1 quotas set by the DEA apply to the supply of
2 opioids in West Virginia?

3 A. Yes.

4 Q. And is it your understanding that the
5 supply of opioids in West Virginia was within the
6 quotas set by DEA?

7 A. I haven't evaluated that.

8 Q. Do you have any knowledge one way or the
9 other as to whether the pills distributed by the
10 distributors in West Virginia were within the DEA
11 quotas?

12 A. I have not evaluated the DEA quotas for
13 West Virginia, so I don't have an opinion on that.

14 Q. Do you know anything about the information
15 that distributors reported to the DEA about their
16 distribution of prescription opioids in West
17 Virginia?

18 A. I have not evaluated any communication with
19 the DEA.

20 Q. And do you know anything about the
21 information the distributors reported to State
22 regulators about their distribution of prescription
23 opioids in West Virginia?

24 A. I have not evaluated that information.

1 Q. And do you know anything about the systems
2 any of the distributors had in place to prevent
3 diversion of prescription opioids in West Virginia?

4 MR. ARBITBLIT: Objection.

5 A. I've seen some literature on that -- on
6 that topic.

7 Q. Is that part of your opinions in this case?

8 MR. ARBITBLIT: Objection.

9 A. I have not -- I have not formed any
10 opinions in the report on that, but if asked about
11 that, you know, I do know something about it. So
12 that was -- that was forming my answer to your
13 question.

14 Q. Okay.

15 MR. HESTER: Let's go off the record a
16 second, if we could.

17 VIDEO OPERATOR: Going off the record.
18 The time is 12:22 p.m.

19 (A discussion was had off the record
20 after which the proceedings continued
21 as follows:)

22 VIDEO OPERATOR: Now begins Media Unit
23 4 in the deposition of Katherine Keyes. We're back
24 on the record. The time is 12:23 p.m.

1 BY MR. HESTER:

2 Q. Doctor Keyes, let me point you to twenty --
3 page 28 of your report, please. And on page 28, in
4 the second full paragraph, starts "The empirical
5 literature demonstrates a strong and statistically
6 significant association between the opioid supply
7 and increase in prescription opioid deaths."

8 Do you see that?

9 A. I do.

10 Q. And is -- is that a point that applies to
11 prescription opioid deaths in West Virginia?

12 A. Yes.

13 Q. When you say "association," what do you
14 mean by that?

15 A. In this particular case, I think that the
16 increase in the supply caused an increase in
17 prescription opioid deaths.

18 Q. And that -- that cause was supply that led
19 to diversion that led to misuse that led to deaths?
20 Is that the sequence that you're -- that you're
21 referring to?

22 MR. ARBITBLIT: Objection.

23 A. That's one sequence. But there are also
24 harms among people who took their medication as

1 prescribed.

2 Q. Do you have any evidence of prescription
3 opioid deaths in West Virginia due to patients who
4 are taking their prescriptions as prescribed?

5 A. Yes. I -- that's been documented in the
6 literature, and I have no reason to think it --
7 that would not generalize to West Virginia.

8 Q. Prescription opioid deaths or misuse?

9 A. Deaths.

10 MR. ARBITBLIT: Objection.

11 Q. What do -- what are you referring to in the
12 literature on that?

13 A. There's a study by Bohnert, and there's two
14 other studies, I believe, that they are in the
15 reference list.

16 Q. The association that you refer to here is
17 the association between the opioid supply and the
18 increase in prescription opioid deaths, right?

19 A. Yes. But that's --

20 Q. And --

21 A. Are you asking me what's written?

22 Q. Yes. And my question is this: Is the
23 supply that you describe here, leads to misuse of
24 prescription opioids? Is that one of the factors

1 you cite?

2 MR. ARBITBLIT: Objection, asked and
3 answered.

4 A. That is one, and there are others as well.

5 Q. And is there empirical literature that
6 demonstrates a strong and statistically-significant
7 association between opioid supply and the increase
8 in prescription opioid deaths when opioids were
9 taken pursuant to a doctor's instructions?

10 A. Yes.

11 Q. And that's the Bohnert study that you
12 referred to?

13 A. I believe there's three studies that have
14 evaluated that, Bohnert, and there's two others
15 that I couldn't find.

16 Q. And those are all cited in your report?

17 A. Yes.

18 Q. When literature speaks about an
19 association, that's -- that has a meaning that's
20 different from cause and effect.

21 MR. ARBITBLIT: Objection.

22 A. Not necessarily. Not in all circumstances.

23 Q. But in some circumstances, an association
24 is different from cause and effect. Right?

1 MR. ARBITBLIT: Objection.

2 A. It would depend on the circumstance. There
3 are -- there are associations. Some of those
4 associations are causal.

5 Q. Let me ask you to look back at Exhibit 106,
6 please.

7 A. Which one is 106?

8 Q. Oh, Exhibit 106, it's in your stack
9 already. It's your paper on the urban --

10 A. I see.

11 Q. -- versus rural divide. And I wanted to
12 point you to E-54 of the paper, please. And
13 there's a sentence in the middle column just before
14 the "Outmigration of Young People" reference, and
15 it says, "A higher density of available opioids may
16 create opportunities for illegal markets in rural
17 areas because family and friends are a primary
18 distribution source of nonmedical prescription
19 opioids."

20 Do you see that?

21 A. Yes.

22 Q. And is that point applicable to West
23 Virginia, in your view?

24 A. Yes.

1 Q. And when you refer there to "illegal
2 markets," what are you referring to?

3 A. I would refer to, for example, drug
4 selling. Selling an opioid to a friend for money.

5 Q. And why -- why -- well, maybe --

6 MR. HESTER: Let me strike that.

7 Q. You refer there to "illegal markets in
8 rural areas." So you're highlighting this as
9 something that is particularly relevant to rural
10 areas; is that right?

11 A. It occurs in urban areas as well. That
12 statement is in the general context of describing
13 the increase in prescription opioid harms in rural
14 communities, but not every factor is specific to
15 rural communities.

16 It's kind of considered as a whole.

17 Q. But you called this out as something that
18 you saw, illegal markets in rural areas, as
19 something that you had seen?

20 A. In the literature. Yes.

21 Q. You hadn't studied it yourself. You were
22 looking at literature?

23 MR. ARBITBLIT: Objection.

24 A. Let me --

1 Q. That's probably not a fair question to an
2 epidemiologist. I'll strike that.

3 The -- is there something about rural
4 areas that creates unusual opportunities for
5 illegal markets in prescription opioids to arise?

6 A. No.

7 Q. So -- so to discuss this a little bit more,
8 this observation that you're making, when you say
9 "a higher density of available opioids," is that a
10 higher density of available opioids that arises out
11 of prescribing by doctors?

12 MR. ARBITBLIT: Objection.

13 A. I think that it would not be exclusive to
14 prescribing by doctors. It would be availability
15 through other sources as well.

16 Q. And when you say "availability," you mean
17 that the opioids are available in the community?

18 A. Yes.

19 Q. And so what is the reference to "higher
20 density of available opioids" mean? What is higher
21 density?

22 A. That would mean that per capita, there are
23 more opioids available to an individual in these --
24 some of these rural areas, especially in West

1 Virginia.

2 Q. And so -- and so that -- that per capita
3 density of opioids created opportunities for misuse
4 of opioids?

5 A. Yes.

6 Q. And that misuse led to harm in some
7 percentage of cases?

8 A. In some percentage of cases. That's not
9 the only source of harm, but it is one.

10 Q. Is it analogous to saying that when there's
11 a greater density of liquor stores on street
12 corners, there's a higher incidence of alcoholism?

13 A. I wouldn't say it's a one-to-one analogy.
14 But in general, the kind of availability principle
15 is that harms will arise when addictive substances
16 are more available, however that availability comes
17 to be.

18 One way could be through licensed
19 alcohol outlets; and another way could be through
20 bootleg alcohol that someone makes in their house.

21 Q. And in your report at page 12, you refer to
22 addiction and related harms as multi-factorial. I
23 can point you to the reference, but I may have it
24 in your head. This kind -- I wanted to ask you

1 about the phrase "multi-factorial."

2 A. Sure.

3 Q. What does "multi-factorial" mean?

4 A. That generally refers to risk factors.

5 Risk factors generally in epidemiology are causal

6 exposures that may be alone, insufficient and

7 alone, unnecessary to cause an outcome.

8 So many health outcomes have multiple
9 risk factors.

10 Q. And so in your report at page 21, you refer
11 to "individual risk factors" in the second
12 paragraph. Right?

13 A. Yes.

14 Q. And one -- one that you identify is a
15 lifetime history of psychoactive illicit drug use?

16 A. That's right.

17 Q. And another one is lifetime psychiatric or
18 substance use disorder?

19 A. Yes.

20 Q. And so those are factors that are separate
21 from the supply of opioids that would be risk
22 factors for OUD, correct?

23 MR. ARBITBLIT: Objection.

24 A. I don't think they would be separate. We

1 would consider them together in sort of a
2 multi-factorial framework.

3 Q. But so when we talk --

4 A. And --

5 Q. Sorry, go ahead.

6 A. I was going to say, there's only one
7 necessary factor for the opioid use disorder, which
8 is the supply of opioids.

9 Q. Because if you have no supply, you have no
10 OUD, right?

11 A. Yes. And so these other factors kind of
12 potentiate the effect of that supply.

13 Q. So the other factors that you're describing
14 here interact or work together with the supply to
15 create the OUD incidence?

16 A. Or some individuals. But a real Hallmark
17 of the risk factor framework is that none of these
18 factors - except the opioid supply - are necessary,
19 so you know, having an illicit drug use disorder
20 certainly increases your risk of having problems
21 with opioids, but there are people who don't have a
22 risk of illicit drug history who have a lot of
23 problems with opioids.

24 So all of these things increase risk.

1 Q. And they work --

2 MR. ARBITBLIT: Objection.

3 Q. -- they work together to --

4 A. I'm sorry, there --

5 MR. ARBITBLIT: I need to interject,
6 Counsel. The same principle of duplicative
7 questioning applies not only to the articles, but
8 the fact that this witness answered the identical
9 line of questioning in the New York deposition at
10 length about risk factors that are part of this
11 multi-factorial analysis several times through your
12 own partner and other counsel.

13 I know -- I don't know whether you're
14 aware of this and asking the questions anyway or
15 whether you're not aware of it. But it's not
16 appropriate, and I don't want to have to bother the
17 special master again, but if we keep going through
18 things that have been asked and answered that are
19 not unique to West Virginia - like what are risk
20 factors and what's multi-factorial - then we'll
21 call him during the lunch break.

22 MR. HESTER: Well, you know, I'm -- I
23 was -- I was, I think, behaving completely
24 consistently with what the special master

1 contemplated, because I was setting up a general
2 point and then I was going to turn to a discussion
3 of West Virginia.

4 MR. ARBITBLIT: Well --

5 MR. HESTER: I can't -- it's very hard
6 -- it's very hard to set up the specific questions
7 on West Virginia unless I can ask for a baseline
8 understanding and get to a point where the witness
9 and I are speaking on the same language about the
10 basic point. That's all I was doing.

11 MR. ARBITBLIT: And you can ask one
12 question, and that is: Are any of the risk factors
13 that you described in your testimony and previous
14 depositions inapplicable to West Virginia, or would
15 those same risk factors be applicable?

16 She can answer "yes" or "no", and you
17 don't have to repeat at length the same question
18 and answer that extends the deposition.

19 Now you're going to say I'm extending
20 it by arguing. Well, I'm only arguing because
21 you're repeating questions that are word for word
22 the same as other depositions of this witness.

23 MR. HESTER: Let's just -- let's just
24 keep going. I was -- I was immediately

1 transitioning to West Virginia.

2 BY MR. HESTER:

3 Q. So let's -- Doctor Keyes, let's look back
4 at Exhibit 106. And I wanted to point you to page
5 E-52. And I -- it's the middle column on page
6 E-52, really in almost exactly in the middle of the
7 page. Sur -- "These surveys also report that
8 factors such as polydrug use and depression are
9 associated with nonmedical opioid use in rural
10 areas."

11 Do you see that?

12 A. In the middle column on -- wait, I'm sorry,
13 page 52.

14 Q. Yeah. E-52, it's the end of the first
15 paragraph in the middle column.

16 A. Oh, I see. "These surveys also report."
17 Yes, I see it.

18 Q. And when it refers to poly drug use and
19 depression being associated with nonmedical opioid
20 use in rural areas, is it your understanding that
21 there's something particular about rural areas that
22 makes these factors more relevant for nonmedical
23 opioid use?

24 A. No. Again, this was -- I would consider

1 those risk factors kind of holistically with the
2 rest of the argument of the paper.

3 Q. Do you see that poly drug use and
4 depression are two factors that are associated with
5 nonmedical use of prescription opioids in West
6 Virginia?

7 A. I don't know -- there may be studies
8 specific to West Virginia that would correlate
9 those exposures.

10 Q. Do you have an understanding of that one
11 way or the other?

12 A. I believe that the Jennifer -- yeah,
13 Reference 20, Jennifer Haven, that might be
14 actually Kentucky.

15 I can't name a study off the top of my
16 head, but I believe that risk factors for
17 prescription opioid use have been studied in West
18 Virginia.

19 Q. And do you believe that poly drug use and
20 depression are two of the risk factors for opioid
21 misuse in West Virginia?

22 A. I believe so.

23 Q. Do you also -- if you look over at the
24 right-hand column where it refers to "stressors at

1 a macro level such as economic deprivation,
2 inequality, structural" determination "and other
3 pervasive stressors in the environment" --

4 A. It's discrimination, just so --

5 Q. Oh, sorry. Structural discrimination.

6 Thanks. Is that -- is that observation -- are
7 those stressors at a macro level factors that apply
8 in West Virginia:

9 A. Yes.

10 Q. And then the reference in the next
11 paragraph to family dynamics, the local context,
12 which includes "family dynamics," "family
13 composition" "and family stress," are those factors
14 that apply to opioid misuse in West Virginia?

15 A. I would assume that they do.

16 Q. And then there's a reference to a micro
17 level. There's reference to "genetic
18 vulnerability, neurobiological factors,
19 pharmacological reactivity, personality traits such
20 as sensation-seeking," "psychiatric morbidity."
21 Are those factors that would apply to opioid misuse
22 in West Virginia?

23 A. Yes.

24 Q. Do you know --

1 A. There's also the pharmacological property
2 of the drug to make sure that we're inclusive.

3 Q. So those factors in West Virginia would
4 interrelate with the supply to produce a level of
5 OUD incidence?

6 A. Right. The supply of opioids, and then the
7 supply causes harm, and that harm might be
8 potentiated based on individual community and macro
9 risk factors.

10 Q. Okay. We're just about at 12:45. So why
11 don't we -- why don't we go off the record.

12 VIDEO OPERATOR: Going off the record.
13 The time is 12:42 p.m.

14 (A recess was taken for lunch after
15 which the proceedings continued as
16 follows:)

17 VIDEO OPERATOR: Now begins Media Unit
18 5 in the deposition of Katherine Keyes. We're back
19 on the record. The time is 1:22 p.m.

20 BY MR. HESTER:

21 Q. Doctor Keyes, are you aware that a
22 significant volume of prescription opioids comes
23 into Cabell/Huntington illegally via drug
24 trafficking?

1 MR. ARBITBLIT: Objection.

2 A. By "drug trafficking," just so we're using
3 the term terminology, can you just describe what
4 you mean by that?

5 Q. Sure. What I mean is people who are
6 bringing prescription opioids into the
7 Cabell/Huntington area who do not have authority to
8 distribute prescription opioids.

9 A. I'm aware that there is -- that there is
10 drug trafficking. And I think -- I guess my next
11 question would be, what do you mean by
12 "significant?"

13 Q. Well, it's a fair question, and I was going
14 to ask you. Do you have any understanding as to
15 the share of prescription opioids that come into
16 the Cabell/Huntington community through drug
17 trafficking as contrasted with lawful distribution?

18 A. The data that I have that would speak to
19 that issue that is cited in the report come from
20 national studies on where people obtain opioids who
21 use them, for example, nonmedically.

22 And so I would look to those sources to
23 see, for example, who -- what proportion of people
24 obtain nonmedical prescription opioids from a drug

1 dealer, and I believe that it is between 10 and 20
2 percent, I would say.

3 That would be my estimate.

4 Q. And that's based on the published
5 literature?

6 A. Yes.

7 Q. And do you have an understanding as to who
8 is engaged in this illegal distribution of
9 prescription opioids in Huntington/Cabell?

10 A. I don't know specific individuals.

11 Q. Do you have an understanding that there are
12 drug trafficking organizations that are engaged in
13 the distribution of prescription opioids in
14 Huntington/Cabell?

15 A. That drug trafficking organizations exist?
16 I would say I'm not -- I don't have expertise in
17 the local drug markets of the Huntington/Cabell
18 community specifically, but I would not dispute the
19 likely scenario that such organizations either, you
20 know, informally or more complex organizations --
21 that they do exist in the Cabell/Huntington
22 community.

23 Q. You gave the reference before to an
24 estimate of between 10 and 20 percent of the

1 prescription opioids in the community you thought
2 would be sourced from illegal drug trafficking.

3 A. No, I'm sorry, that's -- just if I could
4 correct you, that's not what -- that's not what the
5 10 to 20 percent was.

6 Q. What's the 10 to 20 percent?

7 A. That's the proportion of people in -- in
8 these other studies who report that they receive
9 prescription opioids from a drug dealer.

10 Q. I see.

11 A. That's not the total share of prescription
12 opioids that are obtained in that way. I just want
13 to make sure I clarify that point.

14 Q. Could you explain what you mean then? If
15 they're not obtained from a drug dealer, they might
16 be obtained indirectly from somebody else who
17 obtained them from a drug dealer? Is that what you
18 mean?

19 MR. ARBITBLIT: Objection.

20 A. The 10 to 20 percent figure that I cited is
21 what my memory is of the literature on where people
22 who use nonmedically -- use prescription opioids
23 nonmedically obtain their opioids. And so people
24 who don't obtain their opioids from a drug dealer

1 might obtain from family or friends or a physician,
2 etc.

3 Q. And so getting to this question of what
4 percentage of prescription opioids available in the
5 community of Huntington/Cabell are sourced from
6 illegal drug trafficking, do you have an estimate
7 of what percentage that is?

8 A. I have not seen a study on that topic.

9 Q. But you do have an understanding that not
10 all of the prescription opioids that are available
11 in the community were lawfully distributed there?

12 A. I would accept that.

13 Q. And do you know the percentage of lawfully
14 distributed versus unlawfully distributed
15 prescription opioids in West Virginia?

16 A. "Distributed" meaning how many are
17 available -- I guess my question is: When you say
18 "distributed," how would one obtain those kind
19 data?

20 Q. Yeah, maybe that's what I'm trying to ask
21 you. But, well, maybe we can back up.

22 You have talked about a total supply
23 that, in your opinion, is excessive in the
24 Cabell/Huntington community. Correct?

1 A. Correct.

2 Q. And that total supply consists of
3 prescription opioids that were distributed from
4 pharmacies to the -- out into the community plus
5 drugs that were illegally distributed into the
6 community? Are those the two sources of the
7 supply?

8 A. I think those are two sources of supply.

9 Q. Are there any others?

10 A. I would say -- I mean, if you're saying
11 kind of pharmacy distribution versus all other, you
12 know, there are prescriptions, for example, that
13 are -- that are lawfully obtained that are not
14 through a pharmacy that they might be, you know,
15 obtained from a doctor in another way, for example.

16 You know, so I just don't want to be --

17 Q. So --

18 A. -- too --

19 Q. Fair enough. So there would be some --
20 some --

21 A. There are legal and illegal. I would say
22 those are two.

23 Q. Some portion of the -- some portion of the
24 supply of prescription opioids in Cabell/Huntington

1 comes from medical sources, whether from pharmacies
2 -- a person went through a prescription or
3 otherwise coming from medical providers. Correct?

4 A. Yes.

5 Q. And then another portion of the supply
6 comes from illegal distribution into the community.
7 Correct?

8 A. Correct.

9 Q. Is there any other supply that gives rise
10 to the harms you are describing?

11 A. No. I mean, I think what you're saying is
12 there are legal and illegal sources of prescription
13 opioids, and I would agree with that.

14 Q. And those two together create the total
15 supply that gives rise to the harms that you've
16 identified?

17 A. Yes.

18 Q. And -- but you don't know the percentage of
19 illegally distributed versus legally distributed in
20 Cabell?

21 A. My opinion would be that the illegally
22 distributed sources represent a minority of the
23 total drug supply.

24 Q. And what -- what's your -- when you say

1 "minority," do you have a number in mind? Are you
2 thinking one third, one quarter, one half? I don't
3 know what you're thinking.

4 A. Sure. Again, I'm drawing on studies that
5 -- that -- where people report how often, for
6 example, they receive medication from a drug
7 dealer, which is 10 to 20 percent.

8 So I would say that the ballpark for
9 the illegal versus legal supply is somewhere in the
10 same range.

11 Q. And so the illegal -- the illegal
12 distribution expands the total supply of
13 prescription opioids in Cabell/Huntington, right?

14 A. Yes.

15 Q. And it expands then the availability of
16 prescription opioids to people in the community,
17 right?

18 A. Yes. Anything that increases the supply
19 increases the availability.

20 Q. And that availability is what leads to
21 misuse and some percentage of harm among misusers,
22 correct?

23 MR. ARBITBLIT: Objection.

24 A. All -- I would say all availability leads

1 to harm.

2 Q. And in your report at page 48, you refer to
3 counterfeit prescription opioids. I can point you
4 to it. But I just wanted to ask you about that
5 point that you make.

6 You recall that you refer at page 48 to
7 illicitly-manufactured prescription opioids?

8 A. I just want to find the section of the
9 report.

10 Q. Yeah, sorry, I should have pointed you
11 there. It's the next to the last paragraph on page
12 48. It's the fourth line down in the paragraph
13 that begins "Finally."

14 A. Sure. "...fentanyl and other high-potency
15 opioids have been adulterating the supply of both
16 heroin and illicitly manufactured opioids."

17 Q. Right.

18 A. Yes.

19 Q. So I wanted to ask you about this reference
20 to illicitly manufactured prescription opioids.
21 What engages in that illicit manufacturing of
22 prescription opioids?

23 A. Who does the manufacturing?

24 Q. Yes. Is that illegal drug traffickers?

1 A. I would imagine. I don't know the sources
2 of illicitly manufactured opioids.

3 Q. And what's the basis for your knowledge
4 about these illicitly manufactured prescription
5 opioids?

6 A. There have been reports in the literature
7 of opioids that are not -- are manufactured not
8 from the -- the drug company that makes them.

9 Q. So what -- when they're illicitly
10 manufactured, it means that they're being made by a
11 drug dealer or somebody else who does not have the
12 authority to manufacture them?

13 A. That would be my -- yes.

14 Q. And what substances are included in these
15 illicitly manufactured prescription opioids?

16 A. Can you describe what you mean by
17 "substances?"

18 Q. Well, yes, I mean, so prescription opioids
19 have certain chemicals in them. Are these
20 illicitly manufactured opioids different from or
21 the same as the lawfully manufactured prescription
22 opioids?

23 A. I don't know the specifics of that.

24 Q. You are aware that they're - at least on

1 some occasions - are being adulterated with
2 fentanyl?

3 A. Yes.

4 Q. And you understand that if a prescription
5 opioid is illicitly manufactured and is adulterated
6 with fentanyl, it would be more deadly than taking
7 a prescription opioid that's not adulterated?

8 A. It would depend on the dose and duration of
9 use of the opioid.

10 Q. Well, all things the same, would --

11 A. Sure.

12 Q. -- would --

13 A. Right. Two pills that are exactly the
14 same, one has fentanyl and one has not, the one
15 with fentanyl will be associated with increased
16 harm.

17 Q. And how long has this activity of illicitly
18 manufactured prescription opioids been going on?

19 A. I'm not aware.

20 Q. Are these distributed by drug traffickers,
21 I assume?

22 A. Among other distributors.

23 Q. Who else aside from drug traffickers
24 distributes illicitly manufactured prescription

1 opioids to your knowledge?

2 A. I mean, I would imagine that they're used
3 in the same informal networks that licitly
4 manufactured prescription opioids would be
5 distributed.

6 Q. In other words, once -- when you say
7 "licitly manufactured prescription opioids," you
8 mean once those licitly manufactured prescription
9 opioids leave the pharmacies and go out into the
10 community, they may fall into the network of people
11 who are distributing those illicit -- those lawful
12 prescription opioids?

13 Is that what you mean?

14 A. I mean that once the -- once the
15 prescription opioid has been created, one way that
16 it gets out into the community is it gets released
17 from a pharmacy. But any way that the licitly
18 manufactured opioid gets into the community, it may
19 be distributed in the same types of networks for
20 which illicitly manufactured opioids are
21 distributed.

22 Q. I was just trying to make sure we were
23 talking about the same word when we used
24 "distributed" there. You're talking about

1 distributed after the lawful pills have left the
2 pharmacy when you're --

3 A. That's one way in which pills are
4 distributed. I'm just saying that however the
5 pills get into the community.

6 Q. And so are you aware of any particular
7 marketplace in Cabell/Huntington for illicitly
8 manufactured prescription opioids?

9 A. No.

10 Q. Do you know how long this practice of
11 illicitly manufactured prescription opioids has
12 been going on?

13 A. No.

14 Q. Do you know whether it's increased in
15 recent years, the phenomenon of illicitly
16 manufactured prescription opioids?

17 A. There may be literature on that topic.

18 MR. ARBITBLIT: I'll just interpose an
19 objection. That's an identical question to the New
20 York deposition. You're doing -- I'm not objecting
21 to the general area. The questions are
22 sufficiently different.

23 But if the questions are absolutely
24 identical, I have to object.

1 Q. What percentage of illicitly -- I'm sorry,
2 let me back up. In the Cabell/Huntington
3 community, am I right that these illicitly
4 manufactured prescription opioids would add to the
5 total supply?

6 A. Yes.

7 Q. And do you know what percentage of
8 prescription opioids in Cabell/Huntington are
9 illicitly manufactured?

10 A. Again, just based on inference, general
11 inference from existing studies, I would -- my
12 opinion would be that it's a -- it's a small
13 minority.

14 Q. Have you seen any studies on that?

15 A. Well, to the extent that, you know, the
16 vast majority of people who receive prescription
17 opioids are doing -- are doing so not from drug
18 dealers or other drug trafficking networks, I would
19 infer that the majority of the prescription opioids
20 that are being supplied are being supplied through
21 one of these other distribution sources.

22 Q. And your point is that the vast majority of
23 people who have access to prescription opioids in
24 Cabell/Huntington have gotten them via a

1 prescription from a doctor or other medical
2 provider?

3 MR. ARBITBLIT: Objection.

4 A. No. What I meant was that the vast
5 minority of the prescription opioids that are
6 consumed are illicitly manufactured prescription
7 opioids.

8 It would be a different question what
9 the rest of the sources are.

10 Q. But you reason into that by -- by reasoning
11 that the vast majority of prescription opioids in
12 Cabell/Huntington are in that community because
13 there was a prescription for them?

14 MR. ARBITBLIT: Objection.

15 A. No. I reason into it based on the existing
16 data of where people who used nonmedically received
17 their prescription opioids.

18 Q. Do you agree that this -- these illicitly
19 manufactured prescription opioids are another
20 source of potential harm in Cabell/Huntington?

21 A. Yes.

22 Q. And do you know what percentage of opioid
23 use disorder from prescription opioids in
24 Cabell/Huntington is attributable to counterfeit

1 pills?

2 A. Again, I would -- my opinion would be that
3 it's a small percentage and that most people who
4 use counterfeit pills are probably using
5 noncounterfeit pills as well.

6 Q. But you don't have --

7 A. My knowledge of opiate use disorder, it
8 would be difficult to maintain an addiction solely
9 on illicitly manufactured opioids. I would imag --
10 there -- people are using both licitly manufactured
11 and illicitly manufactured who have an opioid use
12 disorder on prescription opioids.

13 Q. Would you agree that if somebody took a
14 illicitly manufactured prescription opioid that was
15 laced with fentanyl, it would increase the risk of
16 death?

17 A. Compared to an ill -- compared to a
18 prescription of --

19 Q. All other -- all other things equal,
20 somebody takes a prescription opioid or a number of
21 prescription opioids and in one scenario, they take
22 them without them being lawfully manufactured. In
23 the other scenario, they're illicitly manufactured
24 and laced with fentanyl, that in the second case,

1 there's a higher risk of death?

2 A. Right. Well, what I would say is that if
3 you had two identical pills that were identical in
4 all other ways except the one had fentanyl in it,
5 the one that had fentanyl in it would be more
6 likely to result in harm.

7 Q. Let me ask you to switch subjects a little
8 bit with me. I wanted to ask about your estimates
9 of opioid deaths in Cabell and in West Virginia.
10 First of all, let's just set the table. You're not
11 a medical examiner, right?

12 A. I am not a medical examiner.

13 Q. And you don't have any expertise yourself
14 in determining causes of death?

15 A. I would say that --

16 MR. ARBITBLIT: Objection.

17 A. -- I do have. That's what epidemiologists
18 do.

19 Q. Okay. So you -- you determine causes of
20 death by looking at aggregate populations, but you
21 don't have expertise in determining the cause of
22 death of an individual?

23 MR. ARBITBLIT: Objection.

24 A. I would say that that's part of my

1 expertise, is evaluating the reliability and
2 validity of those types of assessments.

3 Q. Let me ask you to look at page 50 of the
4 report. And this is where you develop an estimate
5 of overdoses directly and indirectly attributable
6 to prescription opioids in West Virginia and Cabell
7 County, right?

8 A. Yes. However, just as a point of
9 clarification, this report does not have the
10 updated numbers in it.

11 Q. Right. So I was going to ask you about
12 that.

13 A. Okay.

14 Q. So that's -- your corrected --

15 A. Yeah.

16 Q. -- your corrected tables, which is that
17 Exhibit 104, you have that there?

18 A. Yes.

19 Q. So that's what I thought we should work off
20 of when I ask some of these questions.

21 A. Fair.

22 Q. So -- but I wanted to ask you first about
23 the methodology. So there's two types of death
24 that you attribute to prescription opioids. One is

1 deaths that you directly attribute to prescription
2 opioids, and the other is those you indirectly
3 attribute. Is that right?

4 A. That's right.

5 Q. And you -- you do this based on a review of
6 death certificates? Is that right?

7 A. In part. That's one of the methodologies
8 used.

9 Q. What else did you look at aside from death
10 certificates?

11 A. We also looked at the proportion of people
12 who don't have a prescription op -- well, we look
13 -- among those who don't have a prescription opioid
14 listed on their death certificate, we used the
15 literature to estimate the portion that are
16 indirectly attributable based on inference from the
17 literature.

18 Q. Where did you get the base data for the
19 information listed on the death certificates?

20 A. The CDC. The National Vital Statistics
21 system.

22 Q. And the death certificates list all of the
23 substances found in the body at the time of death.
24 Is that right?

1 A. They list the substances contributing to
2 the death, I believe.

3 Q. Is it substances contributing to the death
4 or substances found in the body?

5 A. Based on the T codes that I used, I believe
6 that they are contributing to the death.

7 Q. And that judgment is made by whom?

8 A. Usually a medical examiner.

9 Q. And so there can be circumstances where
10 somebody at the time of death has multiple drugs in
11 their body and -- first of all, let me ask you
12 that. I take it that's true, right? At the time
13 of death, you could have people with multiple drugs
14 in their body?

15 A. That's right.

16 Q. And there are occasions where the medical
17 examiner lists the factors that contribute to death
18 as more than one drug?

19 A. That's right.

20 Q. And your judgment and your methodology was
21 that if -- if prescription opioids were listed as
22 one of the contributing factors, you directly
23 attributed the death to prescription opioids even
24 if there were other drugs also identified as

1 contributing causes?

2 A. That's right.

3 Q. And so you could have somebody who had a
4 mix of substances that was 99 percent fentanyl and
5 1 percent prescription opioid at the time of death.
6 Right?

7 MR. ARBITBLIT: Objection. .

8 Q. I'm saying 99 and 1 percent as a fraction
9 of the drugs in their body.

10 MR. ARBITBLIT: Objection.

11 A. That's a hypothetical. I haven't seen data
12 from the Hunt -- Cabell/Huntington community that
13 would list the percentages of each drug that were
14 --

15 Q. I'll agree. Maybe I'll ask it a different
16 way that may be better.

17 So you could have a circumstance where
18 the medical examiner identifies fentanyl and
19 prescription opioid as contributing causes of
20 death, right?

21 A. That's correct.

22 Q. And the medical examiner doesn't list which
23 one is primary or which one is secondary, right?

24 MR. ARBITBLIT: Objection.

1 A. Yeah, in that example, it -- if the
2 fentanyl was in a prescription pill, then both were
3 necessary for the death.

4 Q. Well, I was just asking about fentanyl --
5 let's talk about illicit fentanyl, illegal
6 fentanyl. And --

7 MR. ARBITBLIT: Sorry.

8 Q. -- after 2015 or so, you're aware that
9 there has been a significant spike in illegal
10 fentanyl use in Cabell/Huntington?

11 A. Yes.

12 Q. And so let's -- I just wanted -- it is
13 hypothetical, but to help illustrate what we're
14 talking about, you could have a death certificate
15 that lists fentanyl and heroin as causes of death
16 in the -- without the medical examiner deciding
17 which was primary and which was secondary.
18 Correct?

19 MR. ARBITBLIT: Objection.

20 A. Based on the T codes, you know, I think the
21 T codes are all just listed as contributing causes.
22 The idea is that they interact with each other, so
23 that each one was necessary for the death to occur.

24 Q. And --

1 A. So if opioids and fentanyl were listed,
2 then both were necessary for the death to occur.

3 Q. Well, if they're both contributing causes,
4 one could -- one could be sufficient for the death
5 to occur even if -- even if they're both listed as
6 contributing causes, right?

7 MR. ARBITBLIT: Objection.

8 A. I don't think that would be an accurate
9 representation of what occurs at an opioid overdose
10 death, given that -- unless the individual was
11 taking fentanyl alone, they're taking fentanyl
12 that's been mixed with heroin, and so both were
13 used at the same time, you know.

14 An individual's not using fentanyl
15 alone -- do you know -- if that makes sense.

16 Q. So -- so you're saying that the medical
17 examiner identifies, let's say, the scenario of
18 heroin and fentanyl together, the medical examiner
19 would identify them both as contributing causes and
20 so you would see both as causes that were required
21 for the death?

22 A. Yes.

23 Q. And the same for prescription opioids? If
24 the medical examiner lists a prescription opioid as

1 a contributing cause along with fentanyl, you would
2 see the prescription opioid as a cause of the
3 death?

4 A. Yes.

5 Q. Even though it's not the only cause, right?

6 A. Right.

7 Q. And so you could have a death that is due
8 to multiple causes beyond prescription opioids?

9 A. The question is whether the death would
10 have occurred without the prescription opioid. So
11 if someone is using prescription opioids and
12 benzodiazepines, for example, which is a common
13 combination, it's unlikely that if the person took
14 benzodiazepines alone, they would have died. But
15 the opioid and the benzodiazepine together
16 interacted to cause the death.

17 Q. But you could have a circumstance where
18 somebody could take a prescription opioid and
19 fentanyl together and the fentanyl might be a
20 sufficient cause of death, but heroin was also
21 identified as a -- I'm sorry, prescription opioids
22 is also identified as a cause of death. Right?

23 MR. ARBITBLIT: Objection.

24 A. Usually that would happen because they were

1 taken together. So again, I would say that the
2 person would not have taken fentanyl had the
3 prescription opioid not been there.

4 Do you know what I'm saying? So I
5 would say when the prescription opioid is listed as
6 a cause of death, it's a reliable methodology to
7 consider it a cause of death.

8 Q. Well, when you -- when you talk about
9 "cause" in this -- in this circumstance, you're not
10 talking about sole cause or the only cause. You're
11 talking about one among potentially a number of
12 causes. Correct?

13 MR. ARBITBLIT: Objection.

14 A. The definition of "cause" is a factor
15 without which the outcome would not have occurred.

16 Q. So --

17 A. So there could be multiple causes.

18 Q. There could be multiple causes for a
19 certain event, correct?

20 A. There can be multiple causes, but it's not
21 a cause unless the outcome would not have occurred
22 without it.

23 Q. But the medical examiner doesn't decide
24 whether an outcome would have occurred without the

1 individual cause, right?

2 MR. ARBITBLIT: Objection.

3 A. I think that's probably what the medical
4 examiner is doing with the contributing causes
5 list.

6 Q. And what's the basis for your knowledge of
7 that?

8 A. My experience working with death
9 certificates.

10 Q. So if you have a death certificate that
11 lists prescription opioids and fentanyl as
12 contributing causes, you attribute that death
13 directly to prescription opioids, right?

14 A. Yes.

15 Q. Do you also attribute that death directly
16 to fentanyl?

17 A. If I were to do a different analysis than
18 the one that I did, sure.

19 Q. Because -- because you would also see the
20 fentanyl as a cause of the death?

21 A. Both substances caused the death.

22 Q. Now, let's talk about indirect attribution.
23 So where you have a death where the sole cause is
24 listed as fentanyl, you indirectly attribute a

1 percentage of those deaths to prescription opioids?

2 A. Yes.

3 Q. And what's the methodology by which you do
4 that?

5 A. I tried to be conservative in my estimate
6 and used the NSDUH data, the National Household
7 Survey on Drug Use and Health, and estimated the
8 portion of nonprescription opioid users who used a
9 prescription opioid prior to the nonprescription
10 opioid as an estimate of the transition from
11 prescription opioid to nonprescription opioid.

12 Q. So your assumption in your methodology is
13 that somebody would not have transitioned to
14 fentanyl without a prescription opioid as a prior
15 sequence?

16 MR. ARBITBLIT: Objection.

17 A. I don't think I have to make that
18 assumption for the -- in the methodology. It's an
19 estimate of indirect -- indirect proportion, a
20 conservative estimate of the indirect proportion
21 that would be attributable based on that
22 association.

23 Q. Is there -- is there any study in the
24 published literature that has done this, that has

1 engaged in that indirect attribution of fentanyl
2 test for prescription opioids?

3 A. Certainly. If you look at the opioid
4 simulation literature, these kinds of estimates are
5 used routinely and reliably.

6 Q. So when we talk about causes for a death
7 from fentanyl, I take it you would agree that
8 prescription opioids are not the only cause of a
9 death from fentanyl. Right?

10 A. Prescription opioids were necessary for the
11 death to occur, and it interacted with other drugs.

12 Q. Prescription opioids -- I'm sorry, go
13 ahead.

14 A. So that is how I would frame the causation
15 piece of that.

16 Q. I'm talking about indirect, though, where
17 the --

18 A. Oh.

19 Q. -- where the only cause of death is listed
20 as fentanyl.

21 A. Okay. I'm -- I apologize. Cause of death
22 from fentanyl -- right. I would say --

23 Q. So there's other -- there's other causes of
24 the death from fentanyl aside from prescription

1 opioids, right?

2 A. In terms of indirect attri -- the deaths
3 that are indirectly attributed?

4 Q. Yes.

5 A. Those would be the multi-factorial deaths,
6 yes.

7 Q. So the multi-factorial deaths of somebody
8 from fentanyl would include the social factors and
9 individual factors and environmental factors we
10 discussed before?

11 A. Yeah, depending on the -- on the person,
12 there are -- there's only one necessary cause of
13 death, and that's opioid exposure.

14 And whatever factors also potentiated
15 the risk after the exposure to opioids, there are a
16 number, including fentanyl exposure.

17 Q. But you're assuming then that the opioid
18 exposure is the necessary cause that leads somebody
19 to fentanyl?

20 A. Opioid exposure is a necessary cause of
21 opioid overdose death.

22 Q. But opioid exposure is not a necessary
23 cause of fentanyl, is it?

24 MR. ARBITBLIT: Objection.

1 A. Fentanyl is an opioid.

2 Q. Okay. So I -- maybe back up. Prescription
3 opioid exposure is not a necessary cause of
4 fentanyl -- of deaths from fentanyl, right?

5 A. That's correct.

6 Q. And there are other factors that contribute
7 to a death from fentanyl, including individual
8 factors and social factors and economic factors,
9 right?

10 MR. ARBITBLIT: Objection.

11 A. There certainly could be other factors
12 involved.

13 Q. And also you have a drug dealer that's
14 lacing heroin with fentanyl, that's part of the
15 causation chain, too, right?

16 A. It would depend on the death.

17 Q. Do you know how fentanyl typically gets
18 into the supply chain? Is it typically by
19 adulteration of heroin?

20 A. Yes.

21 Q. Typically users are not seeking out
22 fentanyl by -- on its own, correct?

23 A. Typically.

24 Q. So that in a typical case where a drug

1 dealer laces heroin with fentanyl, the user isn't
2 even aware of that, correct?

3 A. I don't think I would make that blanket
4 statement just based on what we know about drug
5 use. Sometimes users are unaware.

6 Q. But users don't --

7 A. Sometimes users are aware, and they seek it
8 out.

9 Q. But is it your understanding that the
10 general case is that users don't seek out fentanyl?

11 A. I don't think that's my understanding. I
12 think it depends on -- on the individual and the
13 drug market. I mean, there's certainly a lot of
14 literature about heroin users who prefer stronger
15 heroin.

16 Q. So these other causes that we've been
17 discussing, your methodology isn't undertaking to
18 control for the other causes that might also
19 contribute to fentanyl deaths, right?

20 MR. ARBITBLIT: Objection.

21 A. The methodology in assigning attributable
22 and -- directly attributable and indirectly
23 attributable, these factors would not be
24 confounders. There would not be a statistical

1 control for them. That would not be appropriate
2 based on my methodology.

3 Q. But you're not -- you're not trying to
4 measure or figure out the other factors that might
5 also be attributable to the death.

6 MR. ARBITBLIT: Objection.

7 A. My methodology was to assign direct and
8 indirect attribution, and so these other factors
9 would not be relevant to that particular analysis.

10 Q. But you would agree these other factors
11 that we've been discussing are other factors that
12 would be contributory causes to fentanyl deaths.

13 MR. ARBITBLIT: Objection.

14 A. Again, the only necessary factor is the
15 exposure to the opioid, and that's what I was
16 focused on.

17 Q. Well, when you say "exposure to the
18 opioid," because fentanyl is an opioid?

19 A. My analysis was to assign direct and
20 indirect attribution to prescription opioid.

21 Q. But the prescription opioid is not -- is
22 not necessary or sufficient for a fentanyl
23 overdose, is it?

24 A. Not for a fentanyl overdose, no.

1 Q. Because -- because somebody might be taking
2 -- might be overdosing on fentanyl without ever
3 having taken a prescription opioid, correct?

4 A. That's -- that's generally consistent with
5 a risk factor. They -- in general, there can be --
6 you know, the same as smoking and lung cancer.
7 There are lots of people who get lung cancer and
8 never smoked. And there's lots of people who die
9 of fentanyl and other opioid overdose who don't use
10 prescription opioids, and that doesn't make
11 prescription opioids less of a cause.

12 Q. But they're -- they're not the only cause?

13 A. Prescription opioids are not the only cause
14 of opioid overdose.

15 Q. And they're not the only cause of heroin
16 overdoses?

17 A. That's correct.

18 Q. Let me ask you to look at your report, page
19 49, please. At the very bottom of the page, you
20 refer to a "prevalence estimate that ranged from
21 45.5 in 2006 to 62.8 in 2014." Do you see that?

22 A. I do.

23 Q. What's a prevalence estimate?

24 A. So that is the -- that's the proportion of

1 people in that subgroup who experienced the outcome
2 of interest.

3 Q. Okay. So to tie that to these specific
4 circumstances, are -- is that stating that in 2006,
5 for instance, 45.5 percent of those who ended up
6 with a fentanyl overdose began their opioid use
7 with prescription opioids?

8 A. That estimate refers to the proportion of
9 heroin users in the NSDUH data in 2006 who began
10 with nonmedical prescription opioid use.

11 Q. Okay. So that it's NSDUH data focusing on
12 heroin users; is that right?

13 A. Yes.

14 Q. And so it's NSDUH data that reflects that
15 heroin users were -- sorry. It's NSDUH data that
16 reflects that 45.5 percent of heroin users in 2006
17 initiated their opioid exposure with prescription
18 opioids?

19 A. Yes.

20 Q. And the -- for the 2014 number, same
21 question. Does that reflect that 62.8 percent of
22 the heroin users initiated their use of opioids
23 with prescription opioids?

24 A. Yes.

1 Q. And it's measuring prevalence, not instant
2 -- incident. So it's measuring the community of
3 people in a given point in time who gave that
4 answer, correct?

5 A. Well, in this circumstance, it's measuring
6 incidence and prevalence, because we're looking at
7 lifetime heroin use and lifetime initiation of
8 nonmedical prescription opioid use.

9 So it's an incidence measure --

10 Q. So --

11 A. -- versus a prevalence measure.

12 Q. In your report at 48, page 48, you say -
13 toward the bottom of the page - "that approximately
14 70" to "80% of individuals who use heroin began
15 their opioid-using trajectories with prescription
16 opioids." Do you see that?

17 A. Yes.

18 Q. And so these numbers are lower than that 70
19 to 80 percent figure, correct?

20 A. That's correct.

21 Q. And these -- these numbers are the ones you
22 applied in estimating the indirect attribution of
23 fentanyl deaths?

24 MR. ARBITBLIT: Objection.

1 A. Yes. I wanted to apply the most reliable
2 methodology based on my field of expertise in
3 opioid simulation, and we often try to apply
4 conservative estimates in these circumstances.

5 And given that I know that the NSDUH
6 data underestimates heroin use and would thus
7 provide me with the most conservative estimate of
8 this -- this parameter that I was looking to
9 essentially simulate, I relied on -- on a
10 conservative approach, as I outlined in the report.

11 Q. So looking back at Exhibit 104, which is
12 your corrections, and looking at the table here,
13 you ended up -- and maybe -- I'm looking at the
14 first page of Exhibit 104.

15 You ended up with an estimate for --
16 well, I'm sorry. This is -- this table is dealing
17 with opioid use disorder; it's not dealing with
18 death estimates. Right?

19 A. Figure 13 is opioid use disorder.

20 Q. Okay, sorry, we'll go back to that.

21 A. Figure 16 is the deaths.

22 Q. Right, okay, sorry. All right. I'm with
23 you.

24 So you're not able to tell, looking at

1 Figure 16, what percentage of those deaths involved
2 illegally-trafficked prescription opioids, right?

3 A. No.

4 Q. And you don't know the percentage -- so you
5 don't know the percentage of the deaths that are
6 attributable to illegally-trafficked prescription
7 opioids?

8 A. Again, as I testified, I think it would be
9 small. But the WONDER data does not distinguish
10 illegal from legal. But based on other data, I
11 think we can infer that it's a minority.

12 Q. But putting it another way, the death
13 certificates that are the basis for this analysis
14 that you've done, they don't distinguish between
15 somebody who has, at the time of death, an
16 illegally-distributed prescription opioid in them
17 as compared to a legally-distributed?

18 A. No.

19 Q. And is it your understanding that the vast
20 majority of these deaths of -- that you attribute
21 to prescription opioids arise out of misuse?

22 MR. ARBITBLIT: Objection.

23 A. There's such overlap between medical and
24 nonmedical prescription opioid use that I think

1 that it would be inappropriate to characterize the
2 vast majority as misuse.

3 Q. Do you know what percentage of these deaths
4 that you attribute to prescription opioids are due
5 to misuse as contrasted with the percentage due to
6 use under legitimate doctor prescriptions?

7 MR. ARBITBLIT: Objection.

8 A. Given the overlap of medical and nonmedical
9 use, I would say that very few would be
10 attributable only to misuse.

11 Q. Now, but my question is a little different.
12 Do you know the percentage of deaths in this chart
13 that are attributable to people who took
14 prescription opioids solely as prescribed?

15 A. No.

16 Q. Do you know how many of the deaths that you
17 show here on Figure 16 involved counterfeit
18 prescription opioids?

19 A. Again, I would estimate that do be a small
20 number. But it -- but the death certificate does
21 not provide that information.

22 Q. So putting it another way, the death
23 certificate doesn't reflect whether the
24 prescription opioid that's listed as a cause of

1 death was a counterfeit or illegally-manufactured
2 prescription opioid?

3 A. To be honest, I don't know a single case of
4 someone with an opioid use disorder who solely used
5 counterfeit prescription opioids. I mean, as far
6 as I know, the -- everyone who uses counterfeit
7 prescription opioids has also used noncounterfeit
8 prescription opioids, so I don't think there would
9 be --

10 I think it would be highly unlikely
11 that there would be any case of someone for whom a
12 prescription opioid overdose death was not
13 attributable to prescription opioids, whether
14 counterfeit or not.

15 I don't think that distinction would be
16 highly relevant, from me forming my opinions.

17 Q. Now, I wasn't asking whether it would be
18 relevant. I was just asking whether you knew. And
19 I take it you don't know whether the deaths
20 attributed here to prescription opioids, you don't
21 know what percentage of those involved
22 counterfeits.

23 A. No.

24 Q. Doctor Keyes, let me ask you about your

1 opinion on the transition from prescription opioids
2 to heroin and it's -- I think it probably starts
3 around page 46-47. And I guess maybe I'll point
4 you to page 47, at the bottom of that page.

5 And there's a paragraph with a second
6 sentence that says, "A small but significant
7 proportion of individuals who use prescription
8 opioids progress to heroin use." And then over on
9 the next page, 48, you say at the end of that first
10 carryover paragraph, you say, "it is reasonable to
11 conclude that there is a causal relationship
12 between prescription opioid use and heroin use." .

13 Do you see that?

14 A. I do.

15 Q. And are these opinions you also stated in
16 the New York litigation and in the Ohio litigation?

17 A. Yes.

18 Q. Are there any different opinions that
19 you're stating here than those you've stated in
20 those other litigations?

21 A. No.

22 Q. Are there any answers that you gave to any
23 questions in the New York litigation or in the Ohio
24 litigation that would differ from the questions I

1 could ask you here that would be on the same
2 points?

3 A. Nothing comes to mind.

4 Q. Let me ask you -- well, let me ask you
5 first: Have you done any specific study related to
6 West Virginia of the transition from prescription
7 opioid use to heroin use?

8 A. I've reviewed studies that are specific to
9 West Virginia. But I have not myself collected
10 data in West Virginia.

11 Q. Which ones do you have in mind that are
12 specific to West Virginia?

13 A. I believe the Allen study is specific to
14 West Virginia. And I may cite others in here as
15 well.

16 Q. Well, let me be a little more concrete on
17 this just to make sure we're on the same page.

18 At page 46, you refer to -- it's the
19 second paragraph under Sub I, and you refer to
20 "Cross-sectional studies of samples recruited based
21 on nonmedical prescription opioid use"
22 "consistently find strong signals of a
23 relationship." Do you see that?

24 A. I do.

1 Q. And you're referring there to 16 studies
2 that you looked at on this question of the
3 transition from prescription opioids to heroin?

4 A. Not exactly. I reviewed 16 studies. Not
5 all of those were cross-sectional studies.

6 Q. Okay.

7 A. So there were longitudinal, cross-
8 sectional, ethnographic, kind of mixed in those 16.

9 Q. But those 16 studies are the basis for your
10 opinion on this transition from prescription
11 opioids to heroin?

12 A. Yes.

13 Q. And did any of those 16 studies
14 specifically address West Virginia?

15 A. I don't believe so.

16 Q. And --

17 A. Well, I'm sorry. I guess I would qualify
18 that by saying that some of the studies included
19 West Virginia data. A fair number of the studies
20 included West Virginia data. But --

21 Q. Fair enough.

22 A. But not exclusively.

23 Q. But none of them looked specifically at the
24 West Virginia population specifically on this

1 question of transition from prescription opioid to
2 heroin?

3 A. No.

4 Q. And I take it none of them look at the
5 transitions from prescription opioid use to heroin
6 in Cabell/Huntington?

7 A. That's correct. Although the Allen study,
8 I think, is specific to Cabell.

9 Q. Let's see. The Allen study that you refer
10 to, I didn't have that in my list of 16.

11 A. It's not in the 16.

12 Q. Okay.

13 A. It's some data that helped me form my
14 opinions. That study --

15 Q. What is -- what is the Allen study? Do you
16 know? Do you have that cite handy?

17 A. It -- I can find it in my -- in the list.

18 Q. Maybe you can just point me to that so I
19 have it.

20 A. I'm looking at the reference list to find
21 it.

22 I'd have to go over it in more detail,
23 but I'm sure I could send it to you. It's on my
24 Materials Considered list.

1 Q. I'm sorry, Doctor, could you -- my computer
2 froze for a minute. Could you say that again?

3 A. I'm not seeing it in the reference list,
4 but I don't have time to carefully go through it.
5 It's on my Materials Considered list. I'm sure we
6 can send it to you. It's a paper on injection drug
7 use in Cabell.

8 Q. Okay. And just to be clear, it's not one
9 of the 16 that you cite at page 46.

10 A. That's right.

11 Q. Okay. Let me ask you to look, please, at
12 Exhibit 37.

13 KEYES DEPOSITION EXHIBIT NO. 37

14 ("Psychoactive substance use prior to
15 the development of iatrogenic opioid
16 abuse: A descriptive analysis of
17 treatment-seeking opioid abusers" by
18 Cicero, et al. dated 2017 was marked
19 for identification purposes as Keyes
20 Deposition Exhibit No. 37.)

21 Q. And actually, before we get to that one,
22 let's also have you pull out Exhibit 47.

23 A. Okay.

24 Q. Let me ask you about Exhibit -- no, I'm

1 sorry, it's not Exhibit 47 at all. Sorry. My
2 apologies. Exhibit 34. Could you pull that one
3 out, please? Sorry for the confusion.

4 A. All right.

5 KEYES DEPOSITION EXHIBIT NO. 34

6 ("Association of Nonmedical Pain
7 Reliever Use and Initiation of Heroin
8 Use in the United States" by Muhuri,
9 et al. dated August 2013 was marked
10 for identification purposes as Keyes
11 Deposition Exhibit No. 34.)

12 Q. Exhibit 34, just for the record, is a paper
13 by Pradip Muhuri and others entitled "Associations
14 of Nonmedical Pain Reliever Use and Initiation of
15 Heroin Use in the United States."

16 A. Yes.

17 Q. And Doctor Keyes, you're familiar with this
18 study?

19 A. I am.

20 Q. And to your understanding, did the findings
21 of this study apply fully to West Virginia?

22 A. Generally. You know, the specific
23 percentages may vary a bit.

24 Q. But the basic findings are ones that you

1 would agree apply to West Virginia?

2 A. Yeah. I mean, I would say they have --
3 they have estimates of heroin initiation here that
4 I think would be higher in West Virginia than what
5 they report here.

6 Q. What's your basis for saying that?

7 A. My own estimate of the prevalence of OUD in
8 the Cabell/Huntington community.

9 Q. And is that stated in your report
10 somewhere?

11 A. Yes.

12 Q. Where is that stated?

13 A. Page 41, the number of individuals with
14 OUD. I estimated that for each year.

15 Q. This is -- let me point you to page 47 of
16 your report. And it's -- it's the conclusion I
17 pointed you -- or the sentence I pointed you to
18 before, I think, on page 47 toward the bottom where
19 you say, "A small but significant proportion of
20 individuals who use prescription opioids progress
21 to heroin use."

22 Do you see that?

23 A. I do.

24 Q. And you cite the Muhuri paper, Exhibit 34,

1 is the basis for that statement?

2 A. Yes.

3 Q. And so does the Muhuri report reflect what
4 you mean when you say "a small but significant
5 proportion of individuals progress" -- progress "to
6 heroin use"?

7 A. Yes.

8 Q. Okay. And so you would see that
9 as applicable to West Virginia?

10 A. I think the sentence, "A small but
11 significant portion of individuals who use
12 prescription opioids progress to heroin use" would
13 be applicable to West Virginia.

14 Q. And let me ask you to look at Muhuri,
15 please, page 13.

16 Sorry, I noticed when looking at this
17 yesterday, it has no page numbers, of all things.
18 At least on my copy. You might be lucky --

19 A. It has page numbers.

20 Q. Oh, you have page numbers?

21 A. Uh-huh.

22 Q. Wow. You're living better than I am then.

23 So go to page 13. I think it's page
24 13. It's under the heading "Pattern of Heroin

1 Initiation During the 5-year Period after NMPR
2 Initiation" --

3 A. That's not my page 13.

4 Q. Is that 12?

5 A. Are you referring to the text or table?

6 Q. I'm in the text.

7 A. Okay.

8 Q. And there's a heading for "Pattern of
9 Heroin Initiation During the 5-year Period after
10 NMPR Initiation." It's toward the back of the
11 paper. It's above Table 5.

12 A. I see. I'm here.

13 Q. And you see the section, the small section,
14 that's headed "Pattern of Heroin Initiation" --

15 A. Yes.

16 Q. And the sentence that I wanted to ask you
17 about is: "Accumulation of these estimates
18 indicates that, only 3.6 percent of NMPR initiates"
19 "had initiated heroin in first 5 years following
20 first NMPR use." Do you see that?

21 A. I do.

22 Q. The first question is: To your
23 understanding, does that finding apply to West
24 Virginia, the population of West Virginia?

1 A. I would imagine it would be slightly higher
2 because the rate of heroin initiation is generally
3 higher.

4 Q. And you would say "slightly higher." How
5 much higher?

6 A. I mean, hard to know for sure, but I would
7 -- I would guess at least twice as high.

8 Q. Not higher --

9 A. Somewhere between -- somewhere between this
10 estimate and twice as high would be my -- my
11 reasonable estimate.

12 Q. Have you seen any study that reflects that?

13 A. The Allen study estimated at least the
14 number of injection drug users, of which 60 percent
15 would be heroin users, and I think had a higher
16 proportion than this. And that's --

17 Q. But I'm asking specifically about this
18 question of initiation of heroin following
19 nonmedical prescription drug use. And do you have
20 any studies aside from this one that reflects an
21 initiation rate for heroin use following NMPR
22 initiation?

23 A. No. This is -- this is my -- my reasonable
24 estimate based on the data that I've seen. But I

1 don't have any specific studies of this question.

2 I'm inferring from other literature.

3 Q. And you cite Muhuri in your report for the
4 proportion of individuals who used prescription
5 opioids who progressed to heroin. Right?

6 A. Yes.

7 Q. And when you say "use," in that sentence,
8 you're talking about misuse, right?

9 MR. ARBITBLIT: Objection.

10 A. There's a -- there is a lot of overlap
11 between medical and nonmedical use, and so I -- I
12 think just general prescription opioid use in terms
13 of heroin use.

14 Q. But Muhuri's is focused on progression from
15 nonmedical use --

16 A. A large portion of those users are also
17 medical users, based on the literature.

18 Q. But Muhuri is studying the progression of
19 nonmedical use to heroin use, right?

20 MR. ARBITBLIT: Objection. Counsel,
21 now we're off West Virginia and you're repeating
22 the Muhuri questions that have been asked at two
23 different depositions.

24 I'd ask that you move on.

1 MR. HESTER: I'm just -- I'm really
2 just trying to tie it back to the point the witness
3 made about West Virginia.

4 MR. ARBITBLIT: No. No, you're not.
5 If you --

6 MR. HESTER: Yes, I am.

7 MR. ARBITBLIT: Well, there was
8 nothing about West Virginia in that question,
9 Counselor.

10 MR. HESTER: I -- I'm only responding
11 to what she said. I had expected her to agree. I
12 mean --

13 BY MR. HESTER:

14 Q. Doctor Keyes, maybe just a simple point.
15 You're agreeing, I believe, that the statement --
16 that the finding in here, in the Muhuri report that
17 we just looked at, you would agree that that's the
18 only study that you've seen that reflects that
19 progression that applies to West Virginia?

20 MR. ARBITBLIT: Objection. Asked and
21 answered. Misstates the record.

22 A. Yeah, I think I -- there are other studies
23 cited in my report about this progression.

24 Q. No, I'm asking you, have you seen -- have

1 you seen any other report that reflects the same
2 measurement here that applies to West Virginia?

3 I'm trying to ask specifically about
4 West Virginia. Does the -- does the Muhuri finding
5 here that we've just been looking at, does that
6 apply to West Virginia?

7 MR. ARBITBLIT: Asked and answered.

8 A. I would estimate that the initiation of
9 heroin use would be slightly higher. It would be
10 somewhat higher in West Virginia based on
11 well-accepted patterns of use.

12 Q. And your point is, it may be in the range
13 of 5 percent instead of the 3.6 that Muhuri states?

14 MR. ARBITBLIT: Objection.

15 A. 3.6 times 2 would be higher than 5 percent.

16 Q. Okay. So that would be on the upper bound
17 of what you think it would be, in the range of 7
18 percent?

19 A. I would say, yeah, about 7 -- yes. That's
20 my opinion.

21 Q. And let me ask you to look at -- now at
22 Exhibit 27, please.

23 A. I haven't opened that one, right?

24 Q. I think I may have asked you just to open

1 it. It's entitled Increased use of heroin as an
2 initiating opioid of use by Cicero. Did I ask you
3 to open that one?

4 A. That was an exhibit -- there was a Cicero
5 article that was Exhibit 37 that was "Psychoactive
6 substance use prior to the development of
7 iatrogenic opioid abuse?"

8 Q. Yeah, this is another one then.

9 A. 27. Okay.

10 KEYES DEPOSITION EXHIBIT NO. 27

11 ("Increased use of heroin as an
12 initiating opioid of abuse" by Cicero,
13 et al. dated 2017 was marked for
14 identification purposes as Keyes
15 Deposition Exhibit No. 27.)

16 Q. So Exhibit 27, just for the record, is a
17 paper by Cicero, Ellis and Casper entitled
18 "Increased use of heroin as an initiating opioid of
19 abuse." Doctor Keyes, have you seen this study
20 before?

21 A. Yes.

22 Q. And do you see -- let me point you to page
23 64, which is the second page of the document. And
24 I wanted to point you to the right-hand column, the

1 second sentence. It says, "Only 8.7% of opioid
2 initiates who began regular use in 2005 started
3 with heroin, but its use sharply increased
4 thereafter to the point where in 2015, heroin as an
5 initiating opioid was at its highest point, 33.3%."

6 Do you see that?

7 A. I do.

8 Q. And do you know, or do you have an
9 understanding that this finding applies to the West
10 Virginia population?

11 A. I wouldn't -- I wouldn't disagree that the
12 results would generalize.

13 Q. And there's also a further reference just
14 after what I read to you. It says, "with no
15 evidence of stabilization." Do you see that?

16 A. I do.

17 Q. Do you have an understanding that the use
18 of heroin as an initiating opioid has increased in
19 West Virginia since 2015?

20 MR. ARBITBLIT: Objection.

21 A. My understanding is that, you know, even
22 based on this, it's still 70 percent of people who
23 start with prescription opioids, which is what my
24 report stated. That has increased. I don't know

1 of any particular data in West Virginia, although I
2 would imagine that similar trends are emerging in
3 that area.

4 Q. I was asking -- there's a -- your -- I
5 believe you said that you believe -- or you have no
6 reason to disbelieve that these results reported
7 here - heroin as an initiating opioid increasing to
8 33 percent by 2015 - you would expect those results
9 would apply to the West Virginia population?

10 A. That's right.

11 Q. And my question is: Do you have any
12 information as to whether the percentage of heroin
13 as an initiating opioid has increased since 2015 in
14 the U.S. population?

15 A. I don't.

16 Q. And do you have any knowledge as to whether
17 the use of heroin as an initiating opioid has
18 increased in West Virginia?

19 A. No.

20 MR. ARBITBLIT: We've been going about
21 an hour and 15. You want to take about a
22 five-minute break?

23 MR. HESTER: Sure. Sure, that's fine.

24 MR. ARBITBLIT: Thank you.

1 VIDEO OPERATOR: Going off the record.

2 The time is 2:32 p.m.

3 (A recess was taken after which the
4 proceedings continued as follows:)

5 VIDEO OPERATOR: Now begins Media Unit
6 6 in the deposition of Katherine Keyes. We are
7 back on the record. The time is 2:46 p.m.

8 BY MR. HESTER:

9 Q. Doctor Keyes, let me ask you to look at
10 Exhibit No. 37. This is a paper by Cicero, Ellis
11 and Casper entitled "Psychoactive substance use
12 prior to the development of iatrogenic opioid use."

13 Do you have that one there?

14 A. I do.

15 Q. And let me ask you to look at page 2 --
16 well, I should ask you first, have you seen this
17 study before?

18 A. I have.

19 Q. Let me ask you to look at page 243, which
20 is the second page of the paper. And there's a --
21 it's under Discussion and Conclusions, and it says,
22 "The results of this study indicate that only 4% of
23 those who experience their first opioid via a
24 physician's prescription were truly drug naive.

1 Rather, more than 95% had significant psychoactive
2 drug experience prior to being prescribed their
3 first opioid."

4 Do you see that?

5 A. I do.

6 Q. Do you understand that that finding, as
7 stated here, applies to the West Virginia
8 community?

9 A. I would take that -- I would -- I think we
10 can proceed with that assumption.

11 Q. And at -- later on in the same paragraph,
12 it says, "70% had experience with other types of
13 drugs; and, second, on average, four to five
14 different types of drugs were used prior to initial
15 opioid exposure from a prescription."

16 Do you see that?

17 A. I do.

18 Q. And to your understanding, does that
19 finding also apply to the West Virginia population?

20 A. To my understanding.

21 Q. Let me ask you to look at Exhibit 46,
22 please.

23 Let me see if this is one we've already
24 opened?

1 A. I believe it is. I don't have 46.

2 Q. Yes, I believe we have looked at 46 before.
3 This is -- for you to find this one, it's by
4 McCabe, and it's called "A prospective study of
5 nonmedical use of prescription opioids during
6 adolescence."

7 A. I have it. Can you just tell me again what
8 Exhibit No. this is? I'm just going to write it at
9 the top.

10 Q. Yeah, 46.

11 MS. DO AMARAL: And we'll just note
12 for the record that the exhibits, once they come
13 out of their pouches, don't have exhibit numbers on
14 them, so we're having some difficulty identifying
15 which one we're looking for.

16 MR. HESTER: Right.

17 Q. So just feel free, Doctor Keyes, to write
18 the numbers on there.

19 A. Thank you.

20 Q. And I wanted to point you to page 6 of this
21 paper. And it's the start of the second paragraph.
22 It says, "Among adolescents who engaged in
23 past-year NMUPO, approximately 95% also used other
24 substances and the majority simultaneously

1 co-ingested prescription opioids with other
2 substances."

3 Do you see that?

4 A. I do.

5 Q. And to your understanding, does that
6 finding apply to the West Virginia community?

7 A. I would -- I would assume that it
8 generalizes.

9 Q. Let me ask you to look at Exhibit 28,
10 please. This is, again, another new one, I think.

11 A. This is new.

12 KEYES DEPOSITION EXHIBIT NO. 28

13 ("Relationship between Nonmedial
14 Prescription-Opioid Use and Heroin
15 Use" by Compton, et al. dated 1-14-16
16 was marked for identification purposes
17 as Keyes Deposition Exhibit No. 28.)

18 A. Okay.

19 Q. For the record, Exhibit 28 is by -- a paper
20 by Compton -- Wilson Compton and others entitled
21 "Relationship between Nonmedical Prescription-
22 Opioid Use and Heroin use." Have you seen this
23 paper before?

24 A. Yes.

1 Q. And let me ask you to look at page 160 of
2 the document, please. And there's a statement at
3 the -- under Conclusions -- well, maybe before I
4 ask you about the specifics, who is Wilson Compton?
5 Do you know?

6 A. He's the deputy director of the National
7 Institute of Drug Abuse.

8 Q. And is he still in that position?

9 A. As far as I know. But I could be wrong
10 about that.

11 Q. And under Conclusions at the end of the
12 first -- first paragraph, he says, "heroin use
13 among people who use prescription opioids for
14 nonmedical reasons is rare and the transition to
15 heroin use appears to occur at a low rate." Do you
16 see that?

17 A. I do.

18 Q. And to your understanding, does that
19 conclusion apply to West Virginia?

20 MR. ARBITBLIT: I'm just going to
21 object to the reading of the partial sentence.

22 A. Yes, that's a good point. Could we read
23 the entire sentence?

24 Q. Yeah. Why don't we read the whole thing?

1 "Yet, although the majority of current heroin users
2 report having used prescription opioids
3 nonmedically before they initiated heroin use,
4 heroin use among people who use prescription
5 opioids for nonmedical reasons is rare, and the
6 transition to heroin use appears to occur at a low
7 rate."

8 Do you see that?

9 A. I do.

10 Q. And does that conclusion stated here apply
11 to the West Virginia population, to your
12 understanding?

13 MR. ARBITBLIT: Objection.

14 A. Again, as I stated, I think the rate of
15 heroin use is -- is higher in West Virginia than in
16 other areas.

17 Q. And so you would say it's somewhat higher
18 than you would see in the entire U.S.?

19 A. That's right.

20 Q. What are the reasons that the rate of
21 heroin use is higher in West Virginia?

22 A. I mean, in my opinion, it's because the
23 supply of prescription opioids in the 1990s set the
24 stage for a lot of people who had opioid use

1 disorder.

2 Q. There's also -- there's also been an
3 increase in the supply of heroin in West Virginia;
4 is that right?

5 A. There have been increases in the supply of
6 heroin nationally. I haven't seen data that's
7 specific to West Virginia.

8 Q. Have you analyzed that question of how much
9 the supply of heroin has increased in West
10 Virginia?

11 A. My opinion is that people don't use heroin
12 on a lark. It is due to the supply of prescription
13 opioids that set the stage for a whole population
14 of people to be vulnerable to opioid use disorder.

15 So once that stage was set, any
16 increase in the supply of heroin had an active
17 market to supply to.

18 Q. I think I asked you a different question.

19 A. All right, I apologize.

20 Q. My question was, have you looked -- have
21 you looked at the question of how much the heroin
22 supply has increased in West Virginia?

23 A. No.

24 Q. And have you looked at the question of how

1 much the price of heroin has dropped in West
2 Virginia?

3 A. Again, I am aware of data on that
4 nationally, but I have not seen West
5 Virginia-specific data on price.

6 Q. Let me ask you to look -- so -- so we spoke
7 about this one sentence in the -- in the Compton
8 report, and your view is that heroin use is higher
9 in West Virginia than in the rest of the country?

10 A. Yes.

11 Q. And subject to that point, do you agree
12 that this conclusion as stated here applies to West
13 Virginia?

14 MR. ARBITBLIT: Objection.

15 A. I think that -- I don't know -- I can't --
16 I can't say whether -- that it applies.

17 Q. Do you agree with the statement in this
18 paper that "heroin use among people who use
19 prescription opioids for nonmedical reasons is
20 rare"?

21 A. Yes, I agree with that.

22 Q. Further down in the third paragraph,
23 there's a first sentence that reads, "In the
24 majority of studies, the increase in the rates of

1 heroin use preceded changes in prescription-opioid
2 policies, and there is no consistent evidence of an
3 association between the implementation of policies
4 related to prescription opioids and increase in the
5 rate of heroin use or deaths, although the data are
6 relatively sparse."

7 Do you see that?

8 A. I do.

9 Q. Does that conclusion apply to West
10 Virginia, to your understanding?

11 MR. ARBITBLIT: Objection --

12 A. No, I think there is sufficient -- I'm
13 sorry, did I miss something?

14 MR. ARBITBLIT: Go ahead.

15 A. I think that there is sufficient data
16 post-2016 that would -- I think that that
17 conclusion -- as noted by Compton, there was
18 insufficient data, but I think now any reasonable
19 epidemiologist would conclude that there is more
20 sufficient data.

21 Q. And what data are you referring to that
22 came out after 2016?

23 A. There is a number of studies, including
24 some systematic reviews on, for example,

1 prescription drug monitoring programs and how
2 restricting the opioid supply directly led to
3 people who had opioid use disorder transitioning to
4 heroin use.

5 Q. The 16 studies that you rely on in your --
6 in your report, all of them are dated 2015 or
7 before. Correct? Sorry, 2016 or before.

8 A. So in forming my conclusion, I also discuss
9 in that section the PDMP studies that I just
10 mentioned. But the 16 studies on nonmedical -- I'm
11 sorry, prescription opioid use and heroin use, I
12 haven't looked at the dates, but if you have looked
13 and that is -- I would -- I would trust that you
14 know the date.

15 Q. One -- to be clear, one was dated 2016, and
16 all of the rest are before. Does that sound right
17 to you?

18 A. I haven't looked, but I -- I trust you.

19 Q. And so -- so those studies would have been
20 available to Compton at the time he wrote this
21 paper, correct?

22 A. Compton was writing about prescription
23 opioid policies. None of those 16 studies dealt
24 with prescription opioid policies. So those --

1 those 16 studies wouldn't be a specific citation
2 for that statement.

3 Q. Compton goes on in the next sentence to
4 say, "heroin market forces, including increased
5 accessibility, reduced price, and high purity of
6 heroin appear to be major drivers of the recent
7 increases in rates of heroin use."

8 Do you see that?

9 A. I do.

10 Q. And does that conclusion apply to West
11 Virginia?

12 A. The conclusion that would apply to West
13 Virginia here are that there are heroin market
14 forces that have increased accessibility and
15 reduced price, I believe. I would assume.

16 Q. And heroin market forces have increased the
17 accessibility of heroin?

18 A. That's correct.

19 Q. And then the increased accessibility is one
20 factor that leads to increased abuse?

21 A. Of heroin?

22 Q. Yes.

23 A. Yes.

24 Q. Doctor Keyes, are you aware that the supply

1 of prescription opioids in West Virginia has been
2 reducing in the past five years?

3 A. Yes.

4 Q. And your conclusion that you've stated in
5 your report is that when there's an increase in
6 supply of prescription opioids, that leads to an
7 increased incidence of heroin use. Right?

8 A. I'm sorry, let me just read that again.

9 Yes.

10 Q. And so would you also expect that when
11 there is a decline in prescription opioids in West
12 Virginia, there would be a decline in the use of
13 heroin?

14 A. No. Not when there has been a systematic
15 effort to create a population of people who have
16 opioid use disorder and would be vulnerable to
17 additional opioids being introduced into the
18 market.

19 Q. And that vulnerability is based on factors
20 that would include the increased supply of heroin?

21 A. No. That --

22 Q. The --

23 A. The vulnerability to heroin would not be
24 the cause of the supply; it would be -- I'm sorry,

1 it would be the cause of the supply, not the
2 result.

3 Q. Well, but another cause would be an
4 increase in the supply of heroin. That would be
5 another factor that would lead to an increased use
6 of heroin in West Virginia?

7 A. I mean, as I said, I don't know of -- of
8 people who take heroin, you know, randomly, right?
9 You need some vulnerability factors. And the most
10 significant vulnerability factor is access to
11 prescription opioids.

12 Q. There's also vulnerability factors in the
13 West Virginia population that are individual and
14 social and economic, correct?

15 A. That's correct.

16 Q. And so those are also contributing causes
17 to increases in the uses of heroin?

18 A. I would say they all interact with the
19 supply of prescription opioids.

20 Q. And --

21 A. The largest determinant of creating that
22 vulnerability to addiction, to heroin addiction in
23 particular.

24 Q. And then but in West Virginia, you see that

1 there are a number of factors that contribute to
2 the use of heroin?

3 A. Yes.

4 MR. ARBITBLIT: Objection.

5 Q. And that includes -- that includes, as one
6 factor, the increased supply of heroin?

7 A. Yes. To use heroin, you need access to
8 heroin.

9 Q. And so as we spoke about before, the
10 increase in supply creates more availability and
11 creates more risk?

12 A. Yes. That's true.

13 Q. And then individual and social factors are
14 also contributing causes to the use of heroin,
15 right?

16 A. I would say that they interact with opioid
17 access. Because with opioid use disorder, the one
18 necessary cause is access to an opioid.

19 Q. You're aware in West Virginia there has
20 been a spike in the use of heroin?

21 A. I'm generally aware.

22 Q. And there's also been a spike in the use of
23 fentanyl?

24 A. Yes.

1 Q. During the time when prescription opioid
2 levels have declined by about half?

3 MR. ARBITBLIT: Objection.

4 A. The concurrent decline in prescription
5 opioids that coincides with an increase in heroin
6 use is not the comparison that is probably most
7 apt; it is people who were using prescription
8 opioids several years before.

9 Q. No, but I just wanted to -- I understand
10 you're making that point. I'm trying to ask just a
11 factual point about West Virginia.

12 A. I see.

13 Q. Which is, there has been a decline of about
14 50 percent in the level of prescribing of opioids
15 in West Virginia, correct?

16 MR. ARBITBLIT: Objection.

17 A. I'm not familiar with the 50 percent
18 number. I would have to look at the distribution
19 data on that specifically.

20 I know there has been a decline. But
21 I'm not sure if it's been 50 percent. It would
22 really depend on which medication we're talking
23 about.

24 Q. Okay. I'll take you back later and we can

1 look at some of that.

2 A. Okay.

3 Q. Let me ask you to look at page 42 of your
4 report, please. And at page 42, you say that - at
5 the next to the last paragraph on that page - you
6 say, "In 2018 in Cabell County," "84% of" overdose
7 -- "overdose deaths were due to synthetic opioids."

8 Do you see that?

9 A. I do.

10 Q. And that's -- and you compare it, to
11 example -- for example, to "just 10% in 2013." Do
12 you see that?

13 A. Yes.

14 Q. And do you have an understanding as to why
15 there has been this increase in the percentage of
16 overdose deaths due to fentanyl?

17 A. Yes.

18 Q. And what's your understanding of it?

19 A. As I said, I think that the population of
20 people in West Virginia have had a longstanding
21 crisis with opioid use disorder that began with
22 what everyone recognizes as Phase 1 of the opioid
23 crisis, which is prescription opioid addiction, and
24 then people transitioned to heroin use disorder,

1 and that heroin market became adulterated with
2 fentanyl, which is a highly potent synthetic opioid
3 that is more likely to result in overdose.

4 Q. And so the adulteration, as we discussed
5 before, that's being done by drug dealers?

6 MR. ARBITBLIT: Asked and answered.

7 A. Yes, I think we can general -- it's being
8 done in the sort of illicit marketplace.

9 Q. And has there been, to your understanding,
10 an increase in the fraction of heroin that is being
11 adulterated with fentanyl?

12 A. I'm -- I don't know that -- an answer to
13 that.

14 Q. And so if there were a higher fraction of
15 adulterated heroin, that would be a contributor to
16 the increase in fentanyl deaths, right?

17 MR. ARBITBLIT: Objection.

18 A. I don't -- I don't know whether there's a
19 higher fraction of adulterated heroin, but the
20 availability of fentanyl will be correlated with
21 fentanyl deaths.

22 Q. Yeah.

23 A. So to the extent that the availability of
24 fentanyl has increased, for example, via heroin,

1 that would result in more fentanyl deaths.

2 I think that's where I would be in
3 agreement with your question.

4 Q. And you haven't measured the percentage of
5 heroin that's being adulterated by fentanyl over
6 time to figure out whether there's been a change in
7 that level -- that proportion of adulterated
8 heroin?

9 A. I'm not aware of data on that topic.

10 Q. Are you aware of any people who take
11 illicit fentanyl straight up, or is fentanyl,
12 illicit fentanyl, invariably taken as a form of
13 adulterated heroin?

14 A. Fentanyl can be taken as a prescription
15 given to you by your doctor. So there are
16 certainly people --

17 Q. Not illicit fentanyl, right?

18 A. Not illicit fentanyl.

19 Q. Yeah. So I wanted to ask you about illicit
20 fentanyl.

21 A. Yes.

22 Q. You're aware of many people who take
23 illicit fentanyl straight up, or is it your
24 understanding that it's typically an adulterant in

1 heroin?

2 A. I believe there are people who take
3 fentanyl, illicit fentanyl, alone.

4 Q. What percentage?

5 A. But the majority of fentanyl use would be
6 fentanyl that is mixed with heroin.

7 Q. Do you know what percentage of people in
8 Cabell/Huntington are taking fentanyl by itself as
9 compared to an adulterant in heroin?

10 A. I don't. No.

11 Q. Do you have an understanding as to why drug
12 dealers in Cabell/Huntington are adulterating
13 heroin with fentanyl?

14 A. I believe as a cost-saving measure.

15 Q. And why does it save costs?

16 A. It makes the drug stronger with less
17 heroin.

18 Q. So it saves on the cost of heroin, and
19 fentanyl is relatively cheaper?

20 A. Right. You could give someone a smaller
21 amount of heroin and mix it with fentanyl, and it
22 would be as strong as a larger amount of heroin.

23 Q. You don't have any studies that have looked
24 at transitions from heroin to fentanyl in West

1 Virginia, do you?

2 A. I don't.

3 Q. And do you have any studies that have
4 looked at transitions from heroin to fentanyl
5 across the U.S.?

6 A. I have seen literature on that topic. I
7 haven't relied on that literature for this report,
8 but just based on my own knowledge, there is
9 literature in that area. Actually from Maryland, I
10 believe.

11 Q. Do you have -- do you have in mind any
12 studies that show a direct transition from a
13 prescription opioid to fentanyl?

14 A. I would have to review those studies.

15 Q. You don't have any in mind today?

16 A. Today, I do not.

17 Q. Is there any published paper finding that
18 prescription opioid misuse causes fentanyl deaths?

19 A. I guess I -- I think there's a -- quite a
20 wide literature on -- on fentanyl deaths, and
21 fentanyl use, and drug use histories of people who
22 use these types of products.

23 Q. I was --

24 A. So I think --

1 Q. I was asking about ones that find causation
2 between prescription opioid misuse and fentanyl
3 deaths. I take it there's no study that finds
4 that, is there?

5 A. I believe there is in that prescription
6 opioids, illicitly manufactured prescription
7 opioids, can contain fentanyl, which would directly
8 cause death. So that would be a direct causal
9 relationship.

10 Q. I was thinking of a study finding a causal
11 relationship between the use of a
12 legitimately-manufactured prescription opioid and a
13 -- and fentanyl deaths. There's no -- there's no
14 study finding that, is there?

15 MR. ARBITBLIT: Objection.

16 A. No such study would be ethical. So no.

17 Q. Let me ask you to look at page 41 of your
18 report, please. And at the bottom of page 41 of
19 your report, this is where you're talking about the
20 number of people with OUD in Cabell/Huntington,
21 right?

22 A. Yes.

23 Q. By the way, when you use the phrase
24 "Cabell/Huntington community," on this page and

1 elsewhere in your report, what are you referring
2 to? Is it the geographic area that embraces Cabell
3 County and the City of Huntington?

4 A. That's correct.

5 Q. Okay. And you said that there's no
6 systematic way to count the population of people
7 with OUD in Cabell/Huntington; is that right?

8 A. That's right.

9 Q. And you say at page 42 that in the middle
10 of the page -- middle of that carryover paragraph
11 at the top, you say, "The common linkage was
12 history of nonmedical opioid use or dependent use
13 of opioids." Do you see that?

14 You're trying to come up with an
15 estimate of the OUD population in Cabell/Huntington
16 and you say, "The common linkage was history of
17 nonmedical opioids use."

18 A. I'm just trying to find that sentence so I
19 can see --

20 Q. Sorry.

21 A. -- where it -- where does it start?

22 Q. It starts with, "The common linkage" --

23 A. Oh, I'm sorry. I see. I found it.

24 Q. So -- so you're saying here that the common

1 linkage among people in Cabell/Huntington who have
2 OUD symptoms is that they engaged in nonmedical use
3 of opioids?

4 A. No. I'm -- the -- that sentence was about
5 the Larney study, so in the Larney study, it
6 includes different studies in the meta analysis, so
7 the inclusion criteria include people who are in
8 detox for OUD and other services for OUD, but the
9 common linkage among the studies included in Larney
10 is a history of nonmedical opioid use or dependent
11 use of opioids, such as opioid use disorder.

12 Q. So you come up here on pages 42 and 43 with
13 an estimate of the percentage of the population in
14 Cabell/Huntington that has OUD. Correct?

15 A. Yes. Yes.

16 Q. And what -- what -- what is your
17 understanding of the more recent trends? You've
18 done this analysis through 2018. Is that right?

19 A. Yes, through 2018.

20 Q. Have you done any analysis of 2019 or into
21 2020?

22 A. Well, from the CDC, only provisional data
23 from 2019 has been released, so there's not
24 available data yet for 2019 and 2020.

1 Q. Let me ask you to look at your errata sheet
2 which is Exhibit 104. And this is -- this first
3 table is your Figure 13 which is, I think, your
4 corrected figure from what appears on page 43.
5 Right? Of your report.

6 A. Yes.

7 Q. So we should -- we should rely on this
8 corrected Figure 13 that's in Exhibit 104, right?

9 A. Yes.

10 Q. Okay. And so you come up with a prevalence
11 figure for opioid use disorder in West Virginia,
12 Cabell County and nationally, right?

13 A. Yes.

14 Q. And when you say "prevalence" here, it
15 doesn't mean incidence in a given year; it means
16 the prevalence over time of --

17 A. It means prevalence in that year.

18 Q. In that year. So it would be looking at
19 everybody who's got opioid use disorder in that
20 year?

21 A. That's correct.

22 Q. And so you could be -- in between years -
23 maybe to state the obvious - you could have people
24 who have opioid use disorder in both years and

1 they're going to be counted in both of the figures,
2 right?

3 A. In each data point.

4 Q. Right. Right. And so you don't know the
5 percentage of people shown -- the percent -- I'm
6 sorry, maybe --

7 MR. HESTER: Let me strike that.

8 Q. It shows in Figure 13 for 2018 for Cabell
9 County 8.9 percent of the -- of the population has
10 opioid use disorder? Is that correct?

11 A. That's right.

12 Q. And is that 8.9 percent of the adult
13 population, total population? What is that?

14 A. That is the total population.

15 Q. So it would include little babies as part
16 of your percentage?

17 A. That's right.

18 Q. Okay. And you're showing 4 percent OUD
19 disorder in West Virginia, correct?

20 A. Yes. For 2018.

21 Q. And 2 percent in the United States as a
22 whole?

23 A. Yes.

24 Q. So you're coming up with an estimated OUD

1 rate for Cabell/Huntington that is more than twice
2 the level of West Virginia?

3 A. That's right.

4 Q. And have you evaluated the basis for the
5 conclusion that the OUD rate in Cabell
6 County/Huntington would be more than double the
7 level of the State?

8 A. What do you mean, "the basis?"

9 Q. Well, maybe I should back up. I take it in
10 epidemiology, you don't just run numbers; you also
11 try to figure out if they make sense. Right?

12 A. I do.

13 Q. And did you figure out whether it made
14 sense that the OUD rate in Cabell County/Huntington
15 would be more than double the rate across West
16 Virginia?

17 A. Yes. I spoke to people on the ground in
18 the Cabell/Huntington community as well as relied
19 on the report of Todd Davies, which is cited in the
20 report.

21 Q. Okay. So let me just make sure I've got
22 that. So you spoke to people on the ground, and
23 then you looked at the expert report of Todd
24 Davies?

1 A. It was a -- I think a deposition that had
2 some attachments to it that were reports from
3 various -- to various -- reports that were
4 generated for various purposes.

5 Q. Who were the people you spoke to on the
6 ground?

7 A. I spoke to people from EMS; I spoke to
8 people in the school community; I spoke to people
9 in the fire department; I spoke to people in
10 addiction services. Other government officials.

11 Q. And did you keep notes of those
12 discussions?

13 A. Yes.

14 Q. And were those notes included as materials
15 you're relying on?

16 A. I don't know where the notes are at this
17 point.

18 Q. You still have them?

19 A. Uh-huh. Yes.

20 Q. And did you type them up?

21 A. They were handwritten.

22 Q. Keep them, if you could, please.

23 And what did you ask the people in the
24 community?

1 A. I spoke to people in the community about a
2 wide range of topics. Mostly how the opioid crisis
3 has affected people in the community. One thing I
4 talked to them about was how many more people are
5 living longer with OUD, though people are,
6 fortunately, recovering from overdose -- so you've
7 got a bigger proportion of people who have ongoing
8 OUD.

9 In the schools, for example, there is a
10 lot of problems with kids who have a lot of trauma
11 due to parental drug use, and so we talked about
12 that quite a bit.

13 And I also certainly said, you know,
14 I'm seeing - based on my estimates - that, you
15 know, for example, in 2018, upwards of 8-9 percent
16 of people in the Cabell/Huntington community might
17 have OUD; does that seem reasonable?

18 And by and large -- or across the
19 board, people said "Yes."

20 Q. Aside from talking to people in the
21 community, did you look at any structural factors
22 that would explain an OUD level that's twice the
23 level of the state? Did you look at any structural
24 factors in Cabell/Huntington that would explain --

1 A. Could you give me an example of a
2 structural factor?

3 Q. Well, maybe I can put it back to you.
4 We've talked before about individual and social and
5 economic factors that can be drivers of OUD,
6 correct?

7 A. That's right.

8 Q. And those can all be causes that contribute
9 to levels of OUD in a community?

10 A. Certainly.

11 Q. And did you look at any factors - whether
12 individual, social, economic - related to
13 Cabell/Huntington to evaluate whether it made sense
14 that the level of OUD was higher there than in
15 other parts of West Virginia?

16 A. I considered all of those factors in
17 forming my opinion.

18 Q. And what factors did you identify in
19 Cabell/Huntington that, in your view, contributed
20 to this high level of OUD?

21 A. Well, I mean, the one thing that
22 contributes to the high level of OUD is opioids.
23 People don't -- cannot develop or maintain an
24 opioid use disorder without opioid use, so that

1 certainly is front and center in my opinion.

2 But there is a lot of other issues in
3 the Cabell/Huntington community as well that help
4 maintain, you know, people in -- in addiction,
5 including individual risk factors, financial
6 insecurity, trauma.

7 You know, certainly people in the
8 community who have addiction have a lot of other
9 stressful life events.

10 Q. And those are all contributors to the
11 levels of OUD?

12 A. Sure, yeah, absolutely.

13 Q. And did you -- did you look at any data
14 suggesting that the level of prescription opioid
15 use is different in Cabell County as compared to
16 other parts of the state?

17 A. I believe it's higher, based on my review
18 of the literature.

19 Q. And is that a -- when you say "higher," are
20 you talking about the level of opioid misuse is
21 higher in Cabell County?

22 A. That -- opioid misuse is higher in Cabell
23 -- or opioid use disorder, I should say, is higher
24 in Cabell County based on my methodology. And I

1 believe --

2 Q. And -- go ahead.

3 A. I believe prescription opioid use is higher
4 as well.

5 Q. Is the level of prescription opioid misuse
6 higher in Cabell County than in other parts of the
7 state?

8 A. Based on -- oh, prescription opioid misuse?
9 I have not evaluated that.

10 Q. Do you have some reason to think that the
11 level of opioid misuse in Cabell County would be
12 higher than in other parts of the state?

13 A. I would imagine that it is given that the
14 rate of OUD is twice as high than the rest of the
15 state.

16 Q. And the factors that would contribute to a
17 higher level of opioid misuse in Cabell County
18 would include the ones you mentioned, the
19 individual, social and economic factors that would
20 contribute to a higher level of OUD -- of misuse
21 incidence?

22 A. Well, again, and I think opioid use would
23 be the principle driver of opioid misuse. But
24 certainly, other factors interact with opioid use,

1 and so again, these you know, other risk factors
2 certainly would potentiate exposure to opioids.

3 Q. And when you say "potentiate," you mean
4 they would be contributing causes?

5 A. Yes, they would interact with opioid
6 exposure.

7 Q. What I'm trying to get at is whether you
8 have any evidence that the level of opioid use is
9 higher in Cabell/Huntington than in other parts of
10 the state?

11 A. I believe that it is.

12 Q. And what's the basis for that?

13 A. I believe there is data on shipments of
14 opioids, for example. And when you look at
15 overdose, for example, you know, that would all
16 indicate a higher burden.

17 Q. So you would see shipments as a proxy for
18 use because the pills shipped would be then
19 dispensed by pharmacies into the community?

20 A. I would -- I'm not making a judgment about
21 how the opioids are distributed in the community.

22 Q. Well, there can't -- there can't be use
23 unless they get to the community. So when -- so
24 I'm trying to under --

1 A. The pharmacy is one way that that would
2 happen.

3 Q. So I'm trying to understand, when you say
4 you've seen relevant shipment data, you're assuming
5 that the shipments then are dispensed by pharmacies
6 into the community?

7 A. I'm not making that assumption.

8 Q. You don't know one way or the other?

9 A. I think, as we've talked about, there are
10 various ways that opioids that are shipped to a
11 community would get into the community. One way is
12 by walking into a pharmacy with a prescription, but
13 there's other ways as well.

14 Q. Going back to look at this -- this table,
15 this -- sorry, Figure 13. So some percentage of
16 the people with opioid use disorder are going to
17 have misused illegally-trafficked drugs, right?

18 A. Yes.

19 Q. And you don't know what that percentage is?

20 A. Most of the people who've used
21 illegally-trafficked drugs use medically as well.
22 So I would say that given the strong overlap
23 between illegal and legal use of opioids, I would
24 say the majority of people with opioid use disorder

1 - based on available data - have used illegal
2 opioids and legal opioids.

3 Q. So when you're -- when you're measuring
4 opioid use disorder here, this is including people
5 who are abusing heroin and have opioid use disorder
6 from that source. Right?

7 A. That's right.

8 Q. And it would include people who are abusing
9 fentanyl and have opioid use disorder from that
10 source?

11 A. Only to the extent that it overlaps with
12 other opioids.

13 Q. Fentanyl -- I thought you said fentanyl was
14 an opioid.

15 A. Fentanyl is an opioid. But the Larney
16 article that I relied on for forming the basis of
17 this number, there were no studies in which there
18 were fentanyl-only users or users of fentanyl that
19 was laced with cocaine, for example, or another
20 drug.

21 Q. I see. The people who are reflected here,
22 the percentage of people who are reflected as
23 having opioid use disorder, would include people
24 who have misused prescription opioids, right?

1 A. Yes.

2 Q. Do you know what percent -- what the
3 percentage is of substance use disorders in the
4 U.S. population?

5 A. Any substance use disorder?

6 Q. Yes.

7 A. Would you include nicotine dependence in
8 that?

9 Q. We can do it either way.

10 A. Would you -- I -- so including alcohol and
11 nicotine use disorders - which are the most
12 prevalent - I believe past year prevalence would be
13 about 30-35 percent.

14 Q. For -- and that would -- you would
15 characterize 35 percent --

16 A. Yeah, that might be -- lifetime would be
17 30-35 percent.

18 Q. So you would characterize in the U.S.
19 population a lifetime substance use disorder in the
20 range of 35 percent?

21 A. I would imagine so. I -- for alcohol use
22 disorders alone, it would be, I think, in the high
23 20 percents. And that's total population,
24 including the little babies. And so if you include

1 nicotine dependence in that as well, my opinion is
2 you would probably get to 30 or 35 percent.

3 Q. So alcohol use -- so a substance use
4 disorder based on alcohol, you would say, would be
5 about 20 percent of the U.S. population?

6 A. Probably more than 20 percent. Upwards of
7 30 percent.

8 Q. And -- and substance use disorder based on
9 tobacco, doesn't sound like you would put that as a
10 high percentage then.

11 A. How many people have nicotine dependence in
12 the U.S.?

13 Q. I was just trying to get to your number of
14 35 percent or so of the population having substance
15 use --

16 A. Well, that would be -- there's comorbidity,
17 for example, between alcohol disorders and nicotine
18 dependence. So you can't just add the two
19 together, is what I'm saying.

20 Q. I see what you mean. Okay. I'm learning
21 the lingo. So when you say "comorbidity," that
22 means people that might be using both at the same
23 time.

24 A. That's right.

1 Q. What percentage of the U.S. population, to
2 your understanding, has a substance use disorder
3 related to drugs?

4 MR. ARBITBLIT: Objection. What
5 drugs?

6 A. Yeah, I guess -- cannabis?

7 Q. Any drugs. Cocaine, marijuana, heroin,
8 misuse of prescription opioids. The whole gamut.

9 A. So just to be very specific, I mean,
10 cannabis is actually one that we might want to
11 talk, because it is now legal in many states. So
12 would you include that in terms of a drug use
13 disorder?

14 Q. Okay. Fair enough. What percentage of the
15 U.S. population has a substance use disorder
16 associated with cocaine?

17 A. I don't know that off the top of my head.

18 Q. And what percentage of the U.S. population
19 has a substance use disorder associated with
20 methamphetamines?

21 A. Again, for those specific drugs, I don't --
22 I don't -- I -- there is literature in that area,
23 but I don't know it off the top of my head.

24 Q. But in the aggregate, your understanding is

1 that there is a level of substance use disorder
2 across the population that's associated with a
3 number of drugs: Cocaine, methamphetamine and so
4 forth.

5 A. Yes.

6 Q. And that those numbers are ascertainable, I
7 take it?

8 A. I'm sorry? Say that again?

9 Q. That --

10 A. Ascertainable, yes.

11 Q. Yeah.

12 A. There are surveys. They are subject to
13 limitations. But there are regular surveys that
14 are done in the United States on disorders like
15 cannabis use disorder and cocaine disorder and --

16 Q. Would you agree that the level of substance
17 use disorders associated with cocaine and
18 methamphetamine together is 10 percent or more in
19 the U.S. population?

20 A. I don't want to speculate without having
21 the data.

22 Q. Let me ask you to look at page 45 of your
23 report, please. At the top of the page, I wanted
24 to ask you about an assumption. You say, "if 61%

1 of the 8,252 adults are parents" -- do you see
2 that?

3 A. Yes.

4 Q. What's your basis of concluding that 61
5 percent of that group of adults are parents --

6 A. We used the estimate -- or I used the
7 estimate of the Cabell County residents that are
8 between 18 and 64, which is the general age that
9 people use for parent -- for parenthood. That's
10 been used in other studies.

11 Q. Did you think to look at the census data on
12 the percentage of households with children in
13 Cabell County or in West Virginia?

14 A. That could be an underestimate. Based on
15 the work I've done in opioid simulation models,
16 this is the way that other methodologies have done
17 this, so I used a similar methodology.

18 Q. But you didn't look at the census data to
19 check whether it was consistent with 61 percent of
20 the adults?

21 A. I may have checked the census data. I'm
22 not sure. I'd have to go back and look.

23 Q. Let me ask you to look at page 15 of your
24 report. This is where I wanted to ask you about

1 the -- the recent trends in -- in West Virginia and
2 in Cabell County on levels of prescription opioids.

3 So in the paragraph immediately before
4 heading B, you say that opioid prescriptions were
5 at 186 prescriptions per 100 persons as of 2011.
6 Do you see that?

7 A. Yes.

8 Q. And then you say that there's -- there's a
9 rate of 100 person -- I'm sorry, a rate of 92.1
10 prescriptions per 100 persons in the most recent
11 year data available, 2018. Do you see that?

12 A. Yes. Just to note that the prescribing --
13 the 186.6 prescriptions per 100 persons in 2011 was
14 an increase from 175.3 in 2006, and then in 2018,
15 was 92.1 per 100 persons, just so --

16 Q. Right. Right. And where did you get this
17 data?

18 A. The IQVIA data published by county by the
19 CDC.

20 Q. So it reflects -- just looking at these
21 numbers, it shows 186 prescriptions per 100 persons
22 as of 2011, right?

23 A. That's right.

24 Q. And it shows a rate of 92.1 prescriptions

1 per 100 persons as of 2018, right?

2 A. Yes.

3 Q. So that's a 50 percent reduction in the
4 level of prescriptions in Cabell County?

5 A. Approximately.

6 Q. Right. I mean, it's actually a little bit
7 more than 50 percent, right?

8 A. Right.

9 Q. And so -- and that's from 2011 to 2018?

10 A. That's right.

11 Q. Do you know what the trend has been since
12 2018?

13 A. I do not.

14 Q. And this is just counting numbers of
15 prescriptions, right?

16 A. What do you mean by "numbers of
17 prescriptions"?

18 Q. Well, in other words, it's not -- it's not
19 reflecting -- it's not reflecting the duration of
20 the prescriptions. It just reflects the number of
21 prescriptions written for prescription opioids,
22 right?

23 A. That's right.

24 Q. And so -- so we don't know whether there

1 was also a decline in the dose per prescription, do
2 we?

3 MR. ARBITBLIT: Objection.

4 A. I believe those data are available.
5 They're not cited in this paragraph.

6 Q. Do you know what has led to this reduction
7 in the level of prescriptions in Cabell County?

8 A. I believe I would characterize it as
9 multi-factorial.

10 Q. And what are -- what are the factors when
11 you characterize it as multi-factorial?

12 A. Based on the evidence, there have been a
13 number of policies that reduce inappropriate
14 prescribing and other programmatic efforts to
15 reduce the oversupply of opioids.

16 Q. And what are some of the policies you have
17 in mind?

18 A. I believe there's data in West Virginia on
19 their prescription drug monitoring program that I
20 cite in this report which had kind of variable
21 efficacy, but I think there were some parts of the
22 prescription drug monitoring program that were
23 effective in reducing the oversupply.

24 Q. There was also CDC guidance that we

1 discussed before and other guidance?

2 A. Yes.

3 Q. Was there also guidance from the state of
4 West Virginia?

5 A. I have not specifically evaluated guidance
6 from the state of West Virginia.

7 Q. And you also understand, though - as you
8 state here - that doctors are continuing to
9 prescribe opioids at the rate of "almost 1
10 prescription for every person in Cabell County,"
11 correct?

12 A. Yes. Yes.

13 Q. And that reflects -- again, as we've
14 discussed, that reflects doctors' judgments that
15 are being made in 2018 about --

16 A. I think that would be a simplistic --

17 MR. ARBITBLIT: Objection, asked and
18 answered.

19 Q. The -- let's look up higher on the page.
20 There is also a reference to the "MME per person in
21 West Virginia." Do you see that? It's at the
22 paragraph at the end of the paragraph above the one
23 we were just looking at.

24 A. Yes.

1 Q. You don't state those data for Cabell
2 County. Did you only have those data available for
3 West Virginia?

4 A. I believe that the paper that I cite in
5 this paragraph reported at the state level.

6 Q. Did you look at the county level?

7 A. I did, in the next paragraph that we've
8 discussed.

9 Q. Well, but the next paragraph is dealing
10 with numbers of prescriptions, whereas this
11 paragraph above is dealing with MME per person.

12 A. I see. No, I have not looked at the MME
13 per person in Cabell.

14 Q. Do you know that the MME per person has
15 declined in Cabell County?

16 A. I have not seen that data.

17 Q. I take it that the figures you cite here
18 reflect a decline in MME per person of prescription
19 opioids in West Virginia statewide?

20 A. That's right.

21 Q. And have you seen more recent data on that
22 trend in reductions in MME per person?

23 A. I have not.

24 Q. There's -- let me ask you to look at page

1 40, please, of your report. At the very top of the
2 page, you say - first full sentence - "With that
3 caveat, available evidence indicates that
4 non-medical pain reliever use (which is primarily
5 opioids) is declining among non-institutionalized
6 mostly household populations in West Virginia
7 overall."

8 Do you see that?

9 A. I do.

10 Q. What's the basis for your statement there
11 that the nonmedical pain reliever use is declining?

12 A. These are based on the NSDUH data.

13 Q. And did the NSDUH data collect nonmedical
14 pain reliever use?

15 A. Yes.

16 Q. And so -- so this reflects two percentages
17 you report. You report a percentage of 1.20
18 percent to .9 percent. Do you see that?

19 A. I do.

20 Q. What does 1.20 percent in that sentence
21 refer to? Are you saying percentage of households
22 in West Virginia that are engaged in nonmedical
23 pain reliever use?

24 A. That is the percentage of the NSDUH sample,

1 which is noninstitutionalized, mostly households,
2 so generally much lower risk than the general
3 population.

4 Q. But it -- so it's -- when we say
5 "noninstitutionalized household population," that
6 means people who aren't in prison or in a mental
7 facility?

8 A. Substance use treatment, for example.

9 Q. Okay.

10 A. Your highest risk populations are not
11 included in that.

12 Q. Okay. So -- I understand what you're
13 saying. So it's looking at the population that's
14 not in substance abuse treatment, in prison, in a
15 mental facility. And among that population, that's
16 the population that they were referring to as the
17 noninstitutionalized mostly household population?

18 A. Yes.

19 Q. What does "mostly household population"
20 refer to?

21 A. I believe that there are some nonhouseholds
22 that are included in the NSDUH sampling frame. And
23 I would need to go back to the methodology. But,
24 for example, I think that they do attempt to go to

1 college dormitories and some other kind of group
2 quarters.

3 Q. So children in college are considered
4 outside the mostly household population, or they
5 are in?

6 A. I would have to check the methodology to be
7 sure because it's changed somewhat over time. But
8 the reason I said "mostly household" is because I
9 do believe there are some group quarters that are
10 included in this -- attempt to be included in the
11 sampling frame.

12 Q. So when we say "1.2 percent," we're saying
13 of that population, 1.2 percent reported past month
14 nonmedical pain reliever use?

15 A. That's right.

16 Q. And nonmedical pain reliever use would
17 include things other than opioids?

18 A. Typically that estimate from the NSDUH is
19 -- is interpreted as opioid -- nonmedicine
20 prescription opioid use disorder. The examples
21 that are given are opioids, I believe.

22 Q. So if we look at this -- this data, it
23 shows us in 2015-2016, 1.2 percent of this
24 population - the noninstitutionalized population -

1 1.2 percent reported nonmedical use in the prior
2 month?

3 A. That's right.

4 Q. And then that dropped to .9 percent in
5 2017-18 for that same population?

6 A. That's right.

7 Q. And do you have an understanding of what
8 the reason is for the drop in the nonmedical use?

9 A. No. I'm not sure with that particular
10 population why that --

11 I mean, a change from 1.2 to .9 is not
12 that substantial of a change. It could be sampling
13 error.

14 Q. And so another way to put this is that in
15 2017-2018, 99 percent of this population did not
16 report nonmedical use in the last month?

17 A. The sample, yes.

18 Q. Let me ask you to look at page 26 of your
19 report. And at the bottom of the page, the last
20 paragraph, you say that "More recent data generally
21 show that the prevalence of non-medical
22 prescription opioid use is stabilizing or beginning
23 to decline."

24 Do you see that?

1 A. It says "depending on the population and
2 the outcome."

3 Q. Right.

4 A. "And that the burden remains substantial."

5 Q. Right. Totally fair. Totally fair. And
6 that's the whole sentence. I wasn't cutting it
7 off. I wanted to just focus you on the fact "that
8 the prevalence of nonmedical prescription opioid
9 use is stabilizing or beginning to decline."

10 What's your basis for that?

11 A. That, I used the NSDUH data for that
12 statement. Yeah, I used the NSDUH data.

13 Q. Now, this NSDUH data that you report only
14 shows through 2013, right?

15 A. That's correct.

16 Q. Is there more recent data available?

17 A. Yes.

18 Q. And did you look at that more recent data?

19 A. In this paragraph, I did not include the
20 more recent data. But it could be updated to be
21 more recent.

22 Q. Do you know what the data reflect?

23 A. Off the top of my head, I do not.

24 Q. When you say that data from NSDUH indicate

1 that among those 18 through 64, prevalence of
2 nonmedical prescription opioid use decreased from
3 5.4 percent in 2003 to 4.9 percent in 2013, when
4 you refer to 18 through 64, is that the entire
5 population, or is that the noninstitutionalized
6 population again?

7 A. Noninstitutionalized.

8 Q. As NSDUH doesn't include institutionalized
9 in its study --

10 A. That's right.

11 Q. -- or its sampling. And so this -- this
12 number is higher than the figure you showed on page
13 40. On page 40, you showed a decline from 1.2
14 percent to .9 percent, whereas here on page 26, you
15 report 5.4 to 4.9. Now, I know those are different
16 years, but are you reporting some different
17 population in those two figures?

18 A. I would imagine that these are different
19 outcomes: Past month use versus past year uses
20 versus lifetime use. All of those would be
21 different.

22 Q. Oh, so --

23 A. The higher prevalence, it's either past
24 year or lifetime.

1 Q. Okay. So this is looking at a different
2 measurement than the measurement on page 40 which
3 is prior month use.

4 A. That's right.

5 Q. All right.

6 MR. HESTER: Okay. Why don't we take
7 a quick break, if we can, maybe ten minutes or so?
8 Can we come back at 4:00?

9 VIDEO OPERATOR: Going off the record.
10 The time is 3:52 p.m.

11 (A recess was taken after which the
12 proceedings continued as follows:)

13 VIDEO OPERATOR: Now begins Media Unit
14 7 in the deposition of Katherine Keyes. We're back
15 on the record. The time is 4:01 p.m.

16 BY MR. HESTER:

17 Q. Doctor Keyes, let me go back quickly to
18 your errata sheet. And we're talking about Figure
19 13.

20 A. Okay.

21 Q. And so in this figure, the 8.9 percent of
22 the population in Cabell County that you've
23 estimated as having opioid use disorder, that --
24 that includes people who have engaged in misuse of

1 prescription opioids, right?

2 A. Yes.

3 Q. And some of the people who have engaged in
4 misuse of prescription opioids at one time or
5 another had a legitimate prescription for opioids,
6 right?

7 A. Correct.

8 Q. But at the time they were engaged in misuse
9 of opioids, that's not a legitimate medical use,
10 correct?

11 MR. ARBITBLIT: Objection.

12 A. They might be legitimately medically using
13 as well, but typically, the definition of "misuse"
14 includes outside of a doctor's prescription.

15 Q. So the way -- the way you've used misuse in
16 your report is people who are using opioids outside
17 the scope of a doctor's prescription?

18 A. Yeah. Yes.

19 Q. And so for any -- any particular person
20 who's engaged in misuse, if they had a legitimate
21 prescription at one time but they're engaged in
22 misuse later, when you talk about misuse, are you
23 talking about the time in which they were engaged
24 in misuse or the prior time when they were engaged

1 in legitimate use?

2 MR. ARBITBLIT: Objection.

3 A. You can -- people can have a legitimate
4 prescription and concurrently be misusing. So I
5 don't think I would differentiate those two time
6 scales the way that you have.

7 Q. And when they're concurrently misusing
8 prescription opioids, the pills that they're
9 misusing are not covered by a legitimate
10 prescription, right?

11 A. The -- sorry. The misuse definition would
12 be outside of -- so taking more than the doctor
13 prescribed or without a prescription.

14 Q. So the pills that they're misusing are not
15 ones that would be covered by a legitimate
16 prescription?

17 A. That's right.

18 Q. Let me ask you to turn to page 29 of your
19 report, please. And at the bottom of the page, you
20 say that "The supply of opioids was also
21 facilitated by pharmaceutical promotional activity
22 to physicians."

23 Do you see that?

24 A. I do.

1 Q. And when you talk about "pharmaceutical
2 promotional activity to physicians," you're talking
3 about activity by pharmaceutical companies; is that
4 right?

5 MR. ARBITBLIT: Objection.

6 A. This particular sentence refers to
7 pharmaceutical companies, but there's other
8 marketing activities as well. It doesn't preclude
9 other kinds of marketing activities.

10 Q. But here in your report, in this sentence
11 and in this paragraph, you're talking about
12 promotional activity by pharmaceutical companies?

13 A. I'm just not aware -- I think for the most
14 part, the studies that I talk about in this section
15 refer to marketing activities from pharmaceutical
16 companies.

17 Q. And those would also be referred to as
18 manufacturers of pharmaceuticals?

19 A. That's right.

20 Q. Not distributors, correct?

21 A. I'm aware that distributors also engaged in
22 opioid marketing. So I don't preclude that from
23 occurring or contributing to oversupply. But in
24 these sections, I believe I'm referring to

1 specifically monetary value paid to physicians for
2 opioid products, which I believe are a majority of
3 pharmaceutical companies, manufacturing companies.

4 Q. So the activities that you're discussing in
5 this paragraph from 29 over to 30, that's dealing
6 with activities engaged in by manufacturers.

7 A. I believe so.

8 Q. And the reference -- you're talking, in
9 particular, on this paragraph on 29 and 30, you're
10 talking about outreach by pharmaceutical companies
11 to doctors, correct?

12 A. I'm referring to payments to physicians for
13 -- with regard to opioid products. And so it could
14 include outreach, but also includes other types of
15 marketing activities.

16 Q. Okay.

17 A. For example --

18 Q. But my point is that insofar as somebody's
19 reaching out directly to doctors, that's activity
20 engaged in by manufacturers, correct?

21 A. In this section. There may be other
22 activities that distributors did to reach out to
23 doctors. I'm evaluating the specific information
24 that's in this open payments database.

1 Q. Are you aware of -- of any activities
2 engaged in by distributors to reach to doctors
3 about the risks and benefits of particular drugs?

4 A. I know that the distributors engaged in
5 marketing activities with regard to opioid
6 products. But I'm not -- I haven't evaluated the
7 specifics of those marketing activities.

8 Q. So you're not familiar with what
9 distributors have done in relation to promoting --

10 A. I'm generally familiar, but I'm not aware
11 of specific outreaches to doctors.

12 Q. And --

13 A. It could have occurred. I just don't know
14 -- I'm not aware of it.

15 Q. And is your understanding that the outreach
16 to doctors about the risks and benefits of
17 particular drugs is something that's engaged in by
18 manufacturers?

19 MR. ARBITBLIT: Objection, misstates
20 the record and the testimony.

21 A. Yeah, I'm not -- I am specifically in this
22 paragraph talking about a particular data source,
23 this open payments database, which I believe
24 catalogs primarily pharmaceutical manufacturer

1 marketing, but I don't preclude other types of
2 marketing to physicians.

3 Q. But I was asking you a different question.

4 A. All right, I'm sorry, I'm not understanding
5 the question.

6 Q. Are you -- are you aware that manufacturers
7 are the ones who reach out to doctors with -- to
8 describe the risks and the benefits of particular
9 drug products?

10 MR. ARBITBLIT: Objection, vague.

11 A. I'm not aware that manufacturers would be
12 the only ones who would reach out --

13 Q. I didn't ask if they were the only ones. I
14 said are you aware --

15 A. Oh -- I --

16 Q. -- if manufacturers reach out to doctors to
17 describe the risks and the attributes of drug
18 products?

19 MR. ARBITBLIT: Objection to the
20 prelude. And "The ones" was part of your last
21 question, so it did --

22 MR. HESTER: Oh, okay. Dan you're
23 really -- you're engaged in speaking objections
24 now, and you're coaching the witness. Now, please.

1 I think you can state -- you can state your
2 objection to form, and then we'll go on.

3 MR. ARBITBLIT: And it's Don, not Dan.
4 And you're misleading the witness.

5 MR. HESTER: Don. Sorry, Don.

6 MR. ARBITBLIT: You're
7 mischaracterizing your previous question. That's
8 misleading.

9 MR. HESTER: State the objection to
10 form and then me go on, please.

11 MR. ARBITBLIT: Objection to form.

12 MR. HESTER: You're going beyond what
13 you're entitled to be doing.

14 MR. ARBITBLIT: Object to form.
15 Please go on.

16 BY MR. HESTER:

17 Q. So I wanted to ask one question, which is:
18 You're aware that manufacturers engage in outreach
19 to doctors to describe the risks and benefits of
20 particular drugs?

21 A. Yes.

22 Q. Do you have any evidence or information
23 that distributors reach out to doctors directly to
24 describe the risks and the attributes of drugs?

1 MR. ARBITBLIT: Objection.

2 A. I am aware that distributors engage in
3 opioid marketing in general, and I don't preclude
4 that from occurring. But I'm -- that's not what I
5 evaluate in my report, and I don't offer an opinion
6 on it.

7 Q. And so -- and are you aware of activity by
8 distributors to reach out to doctors to describe
9 the risks and the attributes of prescription
10 opioids?

11 A. I haven't evaluated any information on
12 that, so no, I'm not aware of that.

13 Q. And when you talk about promotional
14 activity by distributors in a couple of your
15 answers, Doctor Keyes, are you referring to
16 promotional activity involving outreach by
17 distributors to pharmacies?

18 A. I believe that's part of the marketing
19 activities of the distributors.

20 Q. Let me ask you to look at page 14 of your
21 report, please. At the -- at the bottom of page
22 14, you say, "The increase in opioid prescribing
23 was driven by a multitude of factors, including
24 direct marketing to physician using data that

1 understated opioid use disorder risk in patients."

2 Do you see that?

3 A. I do.

4 Q. And there you're talking about direct
5 marketing to physicians, and the reference you're
6 making there is to direct marketing to physicians
7 by manufacturers; is that right?

8 A. I don't specify who's doing the direct
9 marketing. So any direct marketing that occurred
10 to doctors that underestimated opioid use disorder
11 risks would be included in that statement,
12 regardless of who did the marketing.

13 Q. But the -- I -- so is it your understanding
14 that the direct marketing to physicians using data
15 that underestimated opioid use disorder risks, was
16 that done by manufacturers?

17 A. I am aware of marketing that was done by
18 manufacturers, and there may have been other
19 marketing by other companies as well.

20 Q. What you're specifically discussing in your
21 report is direct marketing by manufacturers to
22 physicians?

23 A. No. I would say that I'm specifically
24 talking about direct marketing by whomever did the

1 marketing.

2 Q. Do you know of any direct marketing by
3 anyone other than manufacturers?

4 A. I know of direct marketing by
5 manufacturers, and I have reviewed some material
6 related to marketing from other companies as well.
7 I don't preclude there being direct marketing to
8 physicians. I haven't evaluated all the marketing
9 materials.

10 Q. And I'll --

11 MR. ARBITBLIT: I'm -- I just need to
12 interpose an objection, Tim, that this is subject
13 matter that's been gone over and you're not asking
14 any questions about a West Virginia nexus.

15 That's my objection. It's based on our
16 previous discussion with the special master.

17 MR. HESTER: I wasn't aware -- I
18 wasn't aware that there had been prior questioning
19 on this. I mean -- I wasn't aware -- I wasn't
20 aware that that was true, Don. Is that --

21 Do you say -- are you telling me
22 there's been prior questioning on -- on these
23 marketing issues in New York or in Ohio?

24 MR. ARBITBLIT: Yes.

1 MR. HESTER: I wasn't aware of it.

2 MR. ARBITBLIT: I appreciate your
3 honesty.

4 BY MR. HESTER:

5 Q. Are you aware of any direct marketing to
6 physicians by distributors in West Virginia?

7 A. I haven't evaluated that. So no, I'm not
8 aware.

9 Q. Are you aware of any direct marketing to
10 physicians by distributors in Cabell or Huntington?

11 A. The same answer. I haven't evaluated any
12 material related to that, so I'm not aware of it.

13 Q. Are you aware -- what -- you had mentioned
14 before marketing activities by distributors. Are
15 you aware of any marketing activities by
16 distributors to any pharmacies in West Virginia?

17 A. I believe that that's been detailed in
18 other reports. I -- from my understanding, is that
19 the distributors do market to pharmacies and do
20 market opioids. So I'm generally aware that that
21 occurs.

22 Q. And you're basing that on other expert
23 reports?

24 A. And the materials therein, yes.

1 Q. Have you -- have you yourself looked at
2 those issues of marketing to pharmacies by
3 distributors in West Virginia?

4 MR. ARBITBLIT: Objection.

5 A. Not beyond what I've read.

6 Q. What you've read in other expert reports?

7 A. And the materials therein.

8 Q. In those other expert reports, you mean?

9 A. That's correct.

10 Q. Are you aware that information on the risks
11 and benefits of prescription opioids was conveyed
12 to doctors in West Virginia by drug manufacturers?

13 A. Yes.

14 Q. And what's your -- what's your
15 understanding of that?

16 A. My understanding of it is that
17 manufacturers understated the risks and overstated
18 the benefits.

19 Q. And have you seen indications that this
20 occurred in West Virginia?

21 A. I believe that there are materials related
22 to that, the Van Zee article, I think, in
23 particular, talks about the West Virginia area.

24 Q. So the materials that you have seen on

1 marketing related to descriptions of the risks and
2 benefits to doctors in West Virginia, that involves
3 materials disseminated or promoted by
4 manufacturers?

5 A. Generally, the materials that I have seen
6 on marketing to physicians has been -- has been
7 with regard to manufacturers. Although again, I
8 don't preclude any other types of companies from
9 marketing opioids.

10 Q. But the only ones you've seen have involved
11 materials developed or used by manufacturers?

12 A. In general, yes. But I've reviewed other
13 material that indicates that there's other kinds of
14 marketing activities as well.

15 Q. Let me -- let me ask you to turn to page 53
16 of your report. And this is where you discuss
17 mortality rates from prescription NSAIDS, right?

18 A. As compared to opioids, yes.

19 Q. And what are prescription NSAIDS?

20 A. Nonsteroidal anti-inflammatories, in
21 general. And they're a prescription medication
22 that is another medication that's used for pain
23 relief.

24 Q. And do you have an understanding that

1 NSAIDS are used as a form of pain treatment in West
2 Virginia?

3 A. I would have no reason to think that they
4 are not used in West Virginia.

5 Q. And do you believe that the statements here
6 on NSAIDS that you lay out apply to the population
7 of West Virginia?

8 A. I would imagine so.

9 Q. So you state here a mortality rate among
10 prescription NSAID users of "47 per 1000 patient
11 years." Is that right?

12 Sorry, it's in the middle of the page.
13 It's about six lines up from the bottom of the
14 page.

15 A. Yes, I see that. The "mortality rate among
16 opioid users is 75 per" 100,000 and among NSAID
17 users is "47 per" 100,000 -- I mean, per thousand.

18 Q. Right. So both of them are per thousand,
19 right? So you found the mortality among opioid
20 users of 75 per 1000 patient years and 47 per 1000
21 patient years among prescription NSAID users. Is
22 that right?

23 A. That's right.

24 Q. And those statistics, in your view, are

1 applicable to the West Virginia population?

2 A. Yes.

3 Q. And the reference to opioid users would
4 include opioid misusers or people engaged in opioid
5 misuse?

6 A. I think this is Medicare beneficiaries who
7 are prescribed opioids.

8 Q. But would it also --

9 A. Or -- they were all medical users.

10 Q. But they could also be nonmedical users?

11 MR. ARBITBLIT: Objection.

12 Q. I'm trying to understand what you're
13 saying. Doctor, can you --

14 A. In addition to medical use, they could also
15 use nonmedically.

16 Q. Right. So the statistic you cite here
17 which you indicated applies to West Virginia could
18 include opioid users who are using them
19 nonmedically?

20 A. The NSAID number could include opioid users
21 who are using nonmedically as well. The comparison
22 is medical users to medical users. Certainly there
23 could be nonmedical users in both groups as well.

24 Q. The -- are you aware of any meaningful

1 level of nonmedical use prescription NSAIDS in West
2 Virginia?

3 A. No, I'm saying the NSAID users could be
4 using prescription opioids nonmedically.

5 Q. Well, let's just first focus on the
6 mortality rate you cite for opioid users. That
7 mortality rate could include people who are engaged
8 in opioid misuse as well as people who have a
9 legitimate prescription, correct?

10 A. That's correct.

11 MR. ARBITBLIT: Object.

12 Q. And the -- the level of death rate you show
13 for prescription NSAID users in West Virginia, what
14 are the factors that contribute to prescription
15 NSAID deaths in West Virginia?

16 A. Can we pull out the study and take a look
17 at it? And we can see exactly what they have in
18 the study.

19 Q. Yeah. I can't promise you I've got that
20 one, actually. I'll see. Let me see if I've got
21 it.

22 A. I just don't want to mischaracterize what
23 the authors wrote.

24 Q. Let me see if I've got that one.

1 Yes, it's Exhibit 96.

2 KEYES DEPOSITION EXHIBIT NO. 96

3 ("The Comparative Safety of Analgesics
4 in Older Adults With Arthritis" by
5 Solomon, et al. dated Dec. 13/27, 2010
6 was marked for identification purposes
7 as Keyes Deposition Exhibit No. 96.)

8 A. And so again the question is, what factors
9 contributed to NSAID mortality?

10 Q. Yes.

11 A. I don't know that they -- the study
12 describes mortality. Let's see.

13 I don't think it describes the specific
14 causes of deaths for the mortality events unless
15 I'm overlooking that.

16 Q. Do you have reason to believe the mortality
17 rate arising out of NSAID use would be any higher
18 in West Virginia, given the population?

19 A. It's possible. There's more -- as we've
20 talked about, there's an increased level of
21 indications for which pain could be a contributing
22 factor.

23 Q. Have you looked at that, whether the level
24 of NSAID mortality in West Virginia is higher than

1 for the country as a whole?

2 A. I have not.

3 Q. Let me ask you, please, to look at Exhibit
4 108.

5 KEYES DEPOSITION EXHIBIT NO. 108

6 ("Prescription opioid use disorder and
7 heroin use among youth nonmedical
8 prescription opioid users from 2002 to
9 2014" by Martins, et al. dated 2-1-18
10 was marked for identification purposes
11 as Keyes Deposition Exhibit No. 108.)

12 A. That's going to be one of the ones that was
13 sent --

14 Q. Yeah. Oh, yea, sorry. It probably was one
15 that was just sent.

16 A. That's okay.

17 Q. Do you have it there?

18 A. I do.

19 Q. So Exhibit 108 is a paper written by Silvia
20 Martins and others, including Doctor Keyes,
21 entitled "Prescription opioid use disorder and
22 heroin use among youth nonmedical prescription
23 opioid users from 2002 to 2014."

24 Doctor Keyes, I take it you're familiar

1 with this paper.

2 A. Yes.

3 Q. Let me ask you -- let me ask you to look at
4 page 7. And I wanted to ask you about the first
5 full paragraph on the page where it says, "Although
6 our study does not assess underlying causes, the
7 increasing trend in prescription opioid use
8 disorder observed in young adults might be at least
9 partially explained by historical factors described
10 elsewhere in the literature."

11 Do you see that?

12 A. Yes.

13 Q. And I wanted to ask you: When you refer to
14 "historical factors described elsewhere in the
15 literature," you're referring to other papers that
16 had previously identified these as factors that
17 might be contributing to prescription opioid use
18 disorder?

19 A. Yes.

20 Q. And let me ask you -- I want to -- I want
21 to go through these ones that you list here and ask
22 if they apply to West Virginia, to your
23 understanding. The first one listed is "a shift in
24 medical practice of prescribing opioids from

1 end-of-life pain and cancer to chronic non-cancer
2 pain, particularly in young adults."

3 Do you see that?

4 A. I do.

5 Q. And is that a factor that you would see as
6 contributing to increases in opioid use disorder in
7 West Virginia?

8 A. Yes.

9 Q. The next one is "an increased rate of
10 opioid prescription by physicians due to a higher
11 sensitivity to patient's pain." Is that a factor
12 you'd see as applying to an increasing trend in
13 prescription opioid use disorder in West Virginia?

14 A. Yes.

15 Q. Next one is "the endorsement of pain as a
16 'fifth vital sign' by the Joint Commission with a
17 controverted pain metric." Do you see that?

18 A. I do.

19 Q. Is that a factor that you would see as
20 contributing to the increasing trend in opioid use
21 disorder in West Virginia?

22 A. Yes.

23 Q. What do you mean there by "controverted
24 pain metric?"

1 A. I'll have to go to that Franklin article,
2 because I'm not exactly sure what "controverted"
3 means in that context.

4 Q. I can tell you I'm not that well prepared.
5 I don't have that one handy, so we can keep going.

6 The next one is "an increased
7 distribution of opioids by the pharmaceutical
8 industry and creation of an opioid rich
9 environment." That's what we've been discussing
10 today, correct?

11 A. Part of what we've been discussing today.

12 Q. Right. The next one is "state lobbying by
13 pain advocates for prescription opioid use."

14 Do you see that as a factor that
15 contributed to the increasing trend for
16 prescription opioid use disorder in West Virginia?

17 A. Yes.

18 Q. Do you see a reference to "'doctor
19 shopping' by patients"?

20 A. Yes.

21 Q. Is that a factor that contributed to the
22 increasing trend to prescription opioid use
23 disorder in West Virginia?

24 A. Yes.

1 Q. Do you see the reference "physician
2 sensitivity to pain exploitation by opioid users"?

3 A. Yes.

4 Q. What does that mean?

5 A. I think that generally means patients who
6 overstate their medical need for opioids in order
7 to obtain the medication from physicians.

8 Q. So that would be something that you would
9 see as contributing to the increase in trend in
10 prescription opioid use disorder in West Virginia?

11 A. Yes.

12 Q. And then there's a reference to
13 "overprescribing," "which leaves excess medications
14 available for misuse or redistribution by a
15 nonmedical-sanctioned venues." Do you see that?

16 A. Yes.

17 Q. And that's a factor that you see as
18 contributing to the increasing trend of
19 prescription opioid use disorder in West Virginia?

20 A. Yes.

21 Q. And the overprescribing there is
22 overprescribing by doctors and the medical
23 community, correct?

24 A. When we're talking about prescribing, yes,

1 that would -- that would refer to the people who
2 are prescribing, the doctors.

3 Q. Doctor Keyes, do you agree that the opioid
4 crisis in Huntington/Cabell is caused, at least in
5 part, by criminal drug trafficking organizations?

6 A. I'm sorry, I'm just going to read the
7 question.

8 I think that drug trafficking
9 contributes to opioid-related harms, yes.

10 Q. And do you believe that people who leave
11 prescriptions lying around in their medicine
12 cabinet where teenagers or others can easily take
13 them contributed to opioid-related harms in
14 Cabell/Huntington?

15 MR. ARBITBLIT: Objection,
16 argumentative.

17 A. They had to get the opioids to begin with,
18 so you know, to the extent that there are opioids
19 that are oversupplied and end up in people's homes
20 that can then be distributed nonmedically, sure.

21 You know, again, availability - kind of
22 what we talk about in this paper, an opioid rich
23 environment due to excess supply of opioids -
24 contributes, and the way in which that excess

1 supply gets funneled into the community, one of
2 those routes is prescriptions sitting around in
3 people's cabinets.

4 Q. Do you agree that the actions of the DEA in
5 increasing the quotas for prescription opioids
6 contributed, in part, to the opioid crisis in
7 Cabell/Huntington?

8 MR. ARBITBLIT: Objection, asked and
9 answered.

10 A. Yes. I think anything that increases the
11 supply. All of the suppliers. So if something
12 contributed to the increase in the supply, then it
13 contributed to the increase in harm.

14 Q. Do you have an understanding that medical
15 insurers encouraged the use of prescription opioids
16 over other alternatives for the treatment of pain?

17 MR. ARBITBLIT: Objection.

18 A. I'm not aware of specific material related
19 to specific insurers. I do know that rates of
20 prescription do correlate with what are on the
21 formularies for different insurance companies.
22 That's been documented in the literature.

23 Q. And do you have an understanding that the
24 policies of insurers contribute to the supply of

1 opioids in West Virginia?

2 A. To the -- yes, to the extent that they made
3 opioids more available.

4 Q. Do you have an understanding that pharmacy
5 benefit managers, with their formulary policies,
6 contributed to the expansion of the supply of
7 opioids in West Virginia?

8 A. I have not evaluated any literature on that
9 topic.

10 Q. Do you have an understanding one way or the
11 other that the West Virginia Board of Medicine was
12 slow in revoking licenses or otherwise shutting
13 down doctors who were engaged in overprescribing?

14 A. Again, I have not seen any literature
15 that's associated that practice with opioid
16 prescribing.

17 Q. Do you have an understanding that the West
18 Virginia Board of Pharmacy was slow in revoking
19 licenses of certain pharmacies and thereby
20 contributed to the supply of opioids in West
21 Virginia?

22 A. I have not evaluated any literature with
23 regard to that.

24 Q. Let me ask you to turn to page 46 of your

1 report, please. Do you have any expertise
2 yourself, Doctor Keyes, in addiction -- addiction
3 abatement or treatment programs?

4 A. I generally have expertise in -- in
5 studying the effectiveness of abatement and
6 treatment programs.

7 Q. So that's -- that's something you engage in
8 through reviewing epidemiological studies?

9 A. For example, yes.

10 Q. And --

11 A. And I've participated in treatment studies
12 as well.

13 Q. Have you -- have you been involved in
14 designing treatment studies?

15 A. Generally, yeah, as an epidemiological
16 study design consultant, yeah.

17 Q. Where have you done that?

18 A. At Columbia.

19 Q. And for what communities?

20 A. Most specifically communities in New York.

21 Q. Have you been engaged in any of the design
22 around abatement programs or treatment programs for
23 Cabell/Huntington?

24 A. No. I have reviewed literature.

1 Q. Let me ask you to look at page 41, please.
2 And I wanted to ask you, at the end of the first
3 full paragraph on that page, you refer to a dis --
4 your discussions with local officials and experts
5 about needs for the community?

6 A. Yes.

7 Q. What -- can you tell me about these
8 discussions with local officials and experts? Who
9 were they?

10 A. My -- I have listed their names here. I
11 can read -- I can read you their names.

12 Q. Okay. The people -- the people you spoke
13 to are the ones who are listed in that paragraph?

14 A. That's right.

15 Q. Are there others you spoke to aside from
16 these folks?

17 A. There are others that I list in other
18 sections of the report. But the people that I
19 spoke with are listed in the report.

20 Q. And in relation to this particular issue,
21 the people you spoke with are the ones who are
22 listed here on these -- on these needs for the
23 community?

24 A. That's right.

1 Q. Did you keep notes of those discussions?

2 A. I did.

3 Q. And are those handwritten notes?

4 A. That's right.

5 Q. You still have them?

6 A. Yes.

7 Q. Okay. I would ask you to keep those too,
8 and we'll pursue that afterwards.

9 A. Sure.

10 Q. Doctor Keyes, I take it you have not
11 yourself been to Cabell County or the City of
12 Huntington?

13 A. I have been to --

14 Q. You have?

15 A. -- both Cabell County and the City of
16 Huntington.

17 Q. Oh, because you've met with these folks.

18 A. I did.

19 Q. That's where you had the meetings?

20 A. Yes.

21 Q. Are you -- do you have expertise in the
22 laws and regulations governing the distribution of
23 controlled substances?

24 A. I've generally reviewed epidemiological

1 literature with regard to opioid policy. So to the
2 extent that the policies have been evaluated in the
3 epidemiological literature, I have expertise in
4 that.

5 Q. Do you have any particular expertise on
6 suspicious order monitoring activities?

7 A. I do not.

8 Q. Have you reviewed any of the orders that
9 were submitted by pharmacies in Cabell/Huntington
10 for prescription opioids?

11 A. No.

12 Q. Have you reviewed any of the diligence
13 files or investigative documents prepared by
14 distributors with respect to customers in
15 Cabell/Huntington?

16 A. I have not.

17 Q. Just looking here at my notes, Doctor
18 Keyes. I may be done.

19 Doctor Keyes, I take it you -- that you
20 have not focused your opinions on any of the
21 individual specific distributors who are defendants
22 in this case?

23 A. My opinions apply to all of the
24 distributors in the case.

1 Q. But you've not reviewed specific documents
2 related to their individual activities?

3 A. Generally, no.

4 Q. Okay.

5 MR. HESTER: I think that's all I
6 have, so I will pass -- pass you along to my
7 colleagues. Thank you, Doctor Keyes.

8 THE DEPONENT: Thank you very much.

9 MR. ARBITBLIT: So to the extent
10 others plan on inquiring, the protocol requires a
11 video feed, which we don't see. Perhaps you have
12 video feed that's not turned on, but to the extent
13 that there is no video feed, we would object that
14 that's not permitted under the protocol.

15 MR. METZ: I've had my video off for
16 most of the day, but it's on now.

17 MR. HESTER: Actually, before you
18 start, Carl, I do -- I did want to state one thing
19 for the record -- and I know that we have a
20 difference of agreement, but -- difference of view
21 on this point.

22 But we -- we have been surprised today
23 by the position taken by the plaintiffs that we
24 could not inquire fully into all aspects of Doctor

1 Keyes' West Virginia report. We had understood it
2 was a stand-alone report and we could inquire into
3 it fully.

4 I understand the ruling by Judge
5 Wilkes, and we undertook as best we could to comply
6 with it during the day. But I did want to state
7 our objection that we continue to believe that we
8 should have been permitted to inquire fully into
9 this report without -- without limitation based on
10 examination on other reports in other
11 jurisdictions, and we have not been able to pursue
12 some lines of inquiry that we have -- we had
13 intended to pursue today with Doctor Keyes.

14 Doctor Keyes, it's no fault of yours,
15 but there's a ruling that was made today that we
16 believe has prejudiced us in relation to our
17 ability to take a full and complete deposition
18 today.

19 MR. ARBITBLIT: And I'll just state
20 briefly for the record that I feel Special Master
21 Wilkes addressed the lack of surprise due to the
22 previous rulings of the Court and that we addressed
23 it with Rule 26 and that his ruling was fair and
24 that we have generally been very accommodating with

1 your questions, and you have covered a lot of
2 ground with articles and subject matter that was
3 the subject of previous depositions, to which we
4 have not objected because you were careful to
5 relate it to West Virginia, which is appropriate
6 under the special master's ruling.

7 So we don't think there's been any
8 surprise, nor any prejudice, nor any reason to be
9 concerned about today's proceedings.

10 MR. HESTER: And just to -- just to
11 follow up very briefly, my point - which I did want
12 to preserve - is that I forewent lines of inquiry I
13 had planned on today that related to Doctor Keyes'
14 West Virginia report, and I had not anticipated
15 that we would be precluded by reports submitted in
16 separate litigation and other jurisdictions, and
17 you know, I understand we have a difference of view
18 on this, and I understand that Judge Wilkes ruled,
19 so we undertook as best we could to comply with the
20 ruling, but I want it to be clear that we do feel
21 surprised.

22 There have been other depositions that
23 have been taken in this West Virginia litigation,
24 other expert depositions, where this objection has

1 not been made. This is the first time this
2 objection has been raised, and it's -- and there
3 have been depositions taken of other experts who
4 have also testified in other cases.

5 So we -- we did forego lines of inquiry
6 that we thought were important and that we had
7 planned to cover today, but we did not.

8 MR. ARBITBLIT: Your position is
9 stated. Let's move on.

10 MR. METZ: Okay. I would suggest --
11 this is Carl Metz. I'd like to go off the record
12 briefly just for a routine break. I'm happy to
13 come back in five minutes or less. I'd also ask if
14 the videographer could give us a current on-record
15 tally, so I know where I'm starting from.

16 VIDEO OPERATOR: Sure, currently.
17 Right now, we've been on the record for - double-
18 check here - 5 hours and 6 minutes, approximately.

19 MR. METZ: Okay. We can go off the
20 record.

21 VIDEO OPERATOR: Going off the record.
22 The time is 4:48 p.m.

23 (A recess was taken after which the
24 proceedings continued as follows:)

1 VIDEO OPERATOR: Now begins Media Unit
2 8 in the deposition of Katherine Keyes. We're back
3 on the record. The time is 4:57 p.m.

4 EXAMINATION

5 BY MR. METZ:

6 Q. Good afternoon, Doctor Keyes. My name is
7 Carl Metz. I represent Cardinal Health. I don't
8 believe we've met before.

9 A. No.

10 Q. And I apologize that I appear to be
11 questioning you from deep in some shadows. I have
12 a choice to my office between a place that has good
13 lighting but unreliable Internet or a place that
14 has good Internet but bad lighting, so I made the
15 obvious choice.

16 A. These are COVID-era tradeoffs we have to
17 make routinely. So I completely understand.

18 Q. I'd like to begin by asking some follow-up
19 questions about two of your earlier answers that
20 I've noted from the realtime. Do you recall
21 testifying about a study by a Doctor Compton, and
22 you were speaking about the availability of
23 additional data subsequent to the time that that
24 study came out. Do you recall that?

1 A. I do.

2 Q. Okay. And as reflected in the realtime
3 around page 201, you had an answer that was along
4 the lines of, "There was insufficient data, but I
5 think now any reasonable epidemiologist would
6 conclude that there was more than sufficient
7 evidence."

8 Do you recall giving that answer?

9 A. You know, I can't quite hear you. You're
10 coming in and out a little bit. I wonder if you
11 could get closer. I apologize.

12 Q. No problem. Let me see if I can figure out
13 the source of that.

14 A. I think I would say my answer is that I --
15 I understand Compton's -- Compton's, you know,
16 reading of the literature, that it was insufficient
17 at that time.

18 And there certainly has been more
19 literature on opioid policy since then. It was
20 specific to his statement on opioid policy.

21 Q. I see. And can you explain why you used
22 the phrase "reasonable epidemiologist" would --

23 THE COURT REPORTER: I'm sorry, I'm
24 having a hard time as well.

1 A. Right. Could you repeat the question?

2 Q. Well, I can. But I want to figure out the
3 systemic issue first. Why don't we go briefly off
4 the record?

5 VIDEO OPERATOR: Going off the record.
6 The time is 5:00 o'clock p.m.

7 (A discussion was had off the record
8 after which the proceedings continued
9 as follows:)

10 VIDEO OPERATOR: Now begins Media Unit
11 9 in the deposition of Katherine Keyes. We're back
12 on the record. The time is 5:02 p.m.

13 BY MR. METZ:

14 Q. Doctor Keyes, thank you for bearing with me
15 with the audio issues I was having. Let me read
16 the quote back to you that I was trying to ask you
17 about before, and I saw that you grabbed the
18 Compton study. My question is not going to be
19 about the Compton study; it's going to be about a
20 particular phrase you used in your answer.

21 You said around -- somewhere around
22 page 201 of the realtime that there was
23 insufficient data, "but I think now any reasonable
24 epidemiologist would conclude that there is more

1 than sufficient data."

2 Do you recall giving that answer?

3 A. I do.

4 Q. Why did you use the phrase "reasonable
5 epidemiologist" in reference to this data issue?

6 A. I just -- I simply meant that anyone who is
7 trained to read this literature, I think, would --
8 would conclude that there is more data at this
9 point for which sufficient conclusions can be
10 drawn.

11 Q. And do you consider yourself to be a
12 reasonable epidemiologist?

13 A. I do.

14 Q. And in another of your answers today -
15 specifically, I think, this was around page 175 of
16 the realtime - and you were testifying in reference
17 to your direct and indirect attribution, and in
18 your answer at several -- in several places, you
19 mention the concept of trying to provide
20 conservative estimates.

21 Do you recall that?

22 A. I do.

23 Q. And in context of epidemiology, what does
24 it mean to offer a conservative estimate?

1 A. Specifically, I -- it depends on the
2 context, and certainly it's not across the board
3 that we would want to provide, quote/unquote,
4 conservative estimates. But for the purpose of
5 what I was engaged in in a section of the report -
6 which was this attribution of deaths to
7 prescription opioids, both directly and indirectly
8 - I felt that a conservative approach would be --
9 would be the most reasonable approach to use for
10 that section.

11 I do a lot of opioid simulation
12 modeling, and that type of approach is -- is a very
13 well-accepted methodology in my field, where when
14 we -- when there is uncertainty around a certain
15 percentage, then we'll use a conservative indicator
16 so that we don't kind of overestimate a certain
17 parameter.

18 Q. Okay, thank you. And I believe
19 specifically your answer - at least according to
20 the realtime - was, "I wanted to apply the most
21 reliable methodology based on my field of expertise
22 in opioid simulation and we often try to" - and I
23 think there might be a typo here, it might be -
24 apply, "conservative estimates in these

1 circumstances."

2 Does that sound correct to you?

3 A. It really depends on what the specific
4 question that we're trying to answer and what the
5 specific parameter that we're trying to estimate
6 is, whether we want a quote/unquote conservative
7 estimate or not, but in many cases, in my
8 experience doing a lot of these similar types of
9 analyses in my field, when there is uncertainty,
10 you know, applying a conservative parameter gives
11 you some assurance that you're not overestimating
12 the -- the harm.

13 Q. And to be clear on this point, you regard
14 your own calculation of the deaths that you say are
15 directly and indirectly attributable to
16 prescription opioids, you regard that to be a
17 conservative estimate? Is that correct?

18 A. That was specifically with regard to the
19 indirect attribution parameter.

20 Q. So my question --

21 A. -- conservative estimate.

22 Q. Okay. So what my question as to the
23 exercise as a whole, do you regard that exercise as
24 a whole - what's ultimately reflected in Figure 16

1 of your errata - do you consider that to be a
2 conservative estimate?

3 A. I wouldn't -- I wouldn't say across the
4 board that every estimate is conservative. I think
5 for that particular parameter, because there was
6 uncertainty around the percentage, I felt that a
7 conservative estimate was a reliable way to apply
8 my methodology.

9 But I wouldn't apply that same logic to
10 every parameter that I estimated in that section of
11 the report.

12 Q. Okay, I see. So if -- if you thought you
13 had more concrete numbers, for example, you might
14 not feel as constrained to apply a conservative
15 approach; you might just apply whatever you think
16 is the most -- the most accurate based on the
17 numbers you have. Would that be fair?

18 A. That would be one example, yes.

19 Q. Is there uncertainty about the OUD
20 population in Cabell County?

21 A. Yes.

22 Q. And I take it then you would have applied a
23 conservative approach to try and to estimate that
24 uncertain number. Is that fair?

1 A. I tried to apply the most reasonable and
2 reliable numbers that I could.

3 Q. The most reasonable and reliable numbers
4 that you could apply. Is that your testimony?

5 A. That's my testimony. That I felt were
6 reasonable and reliable based on my -- my knowledge
7 of the field.

8 Q. Do you consider that OUD estimate to be
9 conservative?

10 A. Yes.

11 Q. Now, would you turn to page 42 of your
12 report? Which I believe is Exhibit 2.

13 A. Yes.

14 Q. Are you there?

15 A. Yes.

16 Q. And about, I think, three-quarters of the
17 way down, you have a paragraph where you're --
18 where you're describing the Larney paper and how
19 you applied the methodology from the Larney paper
20 to -- as part of calculating what you consider to
21 be the OUD population in Cabell County; is that
22 correct?

23 A. That's right.

24 Q. And you describe here at page 42 the need

1 to make an adjustment to a mortality estimate that
2 is found in the Larney paper in order to account
3 for the greater lethality of illicit fentanyl.

4 Is that correct?

5 A. That's correct.

6 Q. Okay. And specifically -- well, before I
7 ask that, why does the greater lethality of
8 fentanyl require you to make an adjustment to the
9 figure that's in Larney?

10 A. Because I would estimate that after 2015,
11 the death rate -- the overdose death rate for
12 individuals with OUD would be higher than .52 per
13 100,000.

14 Q. And just to explain the logic of this, am I
15 correct, the point is: Since fentanyl is much more
16 lethal, the number of overdose deaths attributed to
17 fentanyl implies a smaller population that's
18 encountering fentanyl for --

19 A. (Inaudible).

20 Q. Okay. And so in the logic of that
21 approach, the more lethal your estimate of
22 fentanyl, the smaller the OUD population you would
23 -- you would calculate as a result. Correct?

24 A. That's not exactly correct. It's not the

1 -- it's not the direct lethality comparison. It's
2 the total drug overdose death rate that I'm trying
3 to estimate.

4 So fentanyl -- whatever -- however more
5 lethal fentanyl is than heroin, it wouldn't be a
6 direct multiplier to the death rate, because we're
7 -- what we're trying to estimate is the probability
8 of overdose given OUD, not per use, you know, in a
9 direct comparison of heroin with fentanyl and
10 heroin without fentanyl. That would be --

11 Q. Let me ask that question a little bit
12 better. All else being equal, the greater the
13 lethality of fentanyl as compared to the substances
14 that are studied in Larney, the smaller the OUD
15 population you would infer based on the number of
16 overdose deaths that have occurred, correct?

17 A. Sorry, that -- can you perhaps where we
18 need to come to consensus is your definition of the
19 word "lethality."

20 Q. Sure. I'm using that term in reference to
21 the information contained inside the parentheses
22 on page 42, specifically where you write, "(the
23 overdose rate due to heroin and synthetic
24 non-methadone opioids increased by a factor of

1 three from 2011 to 2015)."

2 A. Okay.

3 Q. So with that understanding, if -- well, let
4 me back -- let me back up. You multiplied it by
5 three in the belief that fentanyl is more lethal
6 than heroin, and so the number of deaths that are
7 coded as fentanyl contributed to implies a smaller
8 population that is encountering fentanyl relative
9 to what would be the same if you had that many
10 deaths attributed to heroin. Right?

11 A. That's right.

12 Q. Okay. And so just keeping that
13 number three in reference, if your estimate was
14 that fentanyl was six times more lethal, right, it
15 would result in -- from this calculation, it would
16 result in a smaller OUD population, correct?

17 A. So again, I -- you're using the term "more
18 lethal," and that's not exactly the method -- it
19 doesn't really -- in order to apply the
20 methodology, at least epidemiologically the way we
21 use the term "more lethal" --

22 I guess what you do mean by "six times
23 more lethal?" If the drug overdose rate is six
24 times -- the way I would use it -- the way I would

1 use the multiplier of three is my estimate is that
2 the drug overdose rate is now three times higher
3 than it was before fentanyl, which is what I
4 observed in the data.

5 Q. Okay.

6 A. If that number had been six times higher,
7 then I would have used a multiplier of six. But
8 the fact that fentanyl might be six times more
9 lethal is not how you apply that methodology. Does
10 that make sense?

11 Q. Yeah, you've now answered it in the way I
12 thought I was asking it.

13 A. Okay. I apologize.

14 Q. My terminology wasn't aligning with yours,
15 but now I understand how you've used it. And just
16 to follow through with that last point, if all else
17 remained equal in the table but you'd used the
18 multiplier of six rather than the multiplier of
19 three, the OUD population you would have calculated
20 would have been smaller than the one you in fact
21 calculated; is that right?

22 A. That's correct.

23 Q. And if that number was - I don't know -
24 twelve, it would be smaller still, right?

1 A. Correct.

2 MR. ARBITBLIT: Objection.

3 Q. Now, you cite here two sources as the basis
4 for that multiplier of three, correct?

5 A. I do.

6 Q. And those -- those sources are what you
7 were basing that multiplier on, right?

8 A. Yes.

9 Q. And if you look in your citations list -- I
10 want to ask you first about one of them.

11 At No. 195, that's the Dowell paper,
12 right.

13 A. That's right.

14 Q. And that paper was published in 2017?

15 A. That's right.

16 Q. And the data contained within the paper
17 only goes through 2015, correct?

18 A. Do you have it as an exhibit?

19 Q. I do.

20 A. May I --

21 Q. Let me -- before I go there, let me first
22 ask this -- in your report, you reference the
23 increase in the overdose rate from 2011 through
24 2015, correct?

1 A. That's right.

2 Q. And do you believe that's because of any
3 relevant time period in the Dowell paper?

4 A. -- the paper --

5 Q. Well, let me ask this -- if the Dowell
6 paper had the same statistics through 2018, would
7 you have stopped at 2015?

8 A. Yeah.

9 MR. ARBITBLIT: Objection.

10 Q. You would have?

11 A. I would have stopped at 2015. That was the
12 relevant time period I was interested in. The 2011
13 to 2015 time period. Because that covers the
14 direct pre- and post-fentanyl introduction. And so
15 that small window was the correct window to
16 estimate the factor of three.

17 If you went through 2018, you would get
18 a much bigger factor, but that wouldn't be relevant
19 to the multiplier that I was interested in.

20 Q. It wouldn't be relevant?

21 A. Correct.

22 Q. Did you -- did you consider applying your
23 multiplier based on data through 2018?

24 A. I considered it and rejected it as

1 nonreliable.

2 Q. Okay. Did you -- had there been any
3 changes in the availability of fentanyl since 2015?
4 And by "fentanyl," I mean illicit fentanyl.

5 A. Have there been any changes in the
6 availability of fentanyl? I'm not quite sure what
7 you mean.

8 Q. It's -- sticking with West Virginia, is
9 illicit fentanyl today available as readily as it
10 was in 2015? Or more or less?

11 MR. ARBITBLIT: Objection.

12 A. I don't have data to speak to that topic.

13 Q. You didn't look at that?

14 A. The availability of fentanyl in 2018?

15 Q. Sorry.

16 A. I don't know of data that would -- that
17 would tell us how more available fentanyl was in
18 2018 than in 2015. We can -- there's synthetic
19 overdose death rates, but not -- I don't know of
20 any data on the availability of fentanyl. Illicit
21 fentanyl.

22 Q. Are there forms of illicit fentanyl
23 available today different in any way from the forms
24 of illicit fentanyl that was available in 2015?

1 A. Could you give me an example of a form?

2 Q. Sure. Fentanyl versus analogs like
3 carfentanil.

4 A. I don't know with respect to West Virginia.

5 Q. Did you look at that in connection with
6 attempting your OUD population estimate?

7 A. That would not be relevant to my OUD
8 population estimate. So no, I didn't.

9 Q. It would -- it -- if a more potent form of
10 fentanyl was available -- a fentanyl analog was
11 available in 2018 that wasn't available in 2015 and
12 that contributed to a higher overdose per 100,000
13 people -- population, that wouldn't be relevant at
14 all to an attempt at conservatively estimating the
15 OUD population based on overdose deaths?

16 Is that your testimony?

17 A. My testimony is that it -- I felt that it
18 was a reliable methodology to use the time period
19 directly pre and directly post the introduction of
20 fentanyl to estimate the total overall increase in
21 the death rate for those years and apply it there
22 forward to all synthetic opioid death rates with
23 the -- with the estimate that the overall drug
24 overdose death rate is approximately three times

1 higher.

2 I think that that's a reliable
3 methodology to use. It's a methodology that's
4 commonly used in my field.

5 Q. Is a methodology that's commonly used in
6 your field when you have unstable patterns?

7 MR. ARBITBLIT: Objection.

8 A. That's right.

9 Q. It is -- your testimony is it is commonly
10 used even when you have unstable underlying
11 patterns that you're trying to use as the basis for
12 the prediction?

13 A. The correction is due to the unstable
14 patterns.

15 Q. But I guess my question -- sorry, it would
16 have been a little more clear. If the pattern
17 continues to be unstable after the period in which
18 you used to select your multiplier, is that an
19 accepted methodology within the field of
20 epidemiology to ignore that further changes in the
21 pat -- in the -- in the underlying number and just
22 stick with the number you would pick from 20 --
23 from a prior year, when there's continued change?

24 MR. ARBITBLIT: Objection.

1 A. I don't have any evidence of a -- of a
2 continued change.

3 Q. Did you investigate whether or not there
4 was evidence of a continued change?

5 A. It did not come up in my literature review.

6 Q. Okay. Do the sources you cite on this page
7 reflect a continued change?

8 A. I'm sorry, what do you mean by "continued
9 change"?

10 Q. I mean, your multiplier is based on the
11 increase in the mortality rate for overdose deaths
12 with synthetic opioids present from 2011 to 2015.
13 Did that number continue to increase from 2015
14 through 2018?

15 MR. ARBITBLIT: Objection.

16 A. I believe that I've explained the
17 methodology. So even if the synthetic opioid
18 overdose at -- I -- even if the synthetic opioid
19 overdose rate continues to increase, the correct
20 multiplier would be the one that's -- that's
21 directly pre and post the introduction of the cause
22 of the change that we're trying to estimate.

23 It would be incorrect to apply a change
24 from, for example, 2011 to 2018. And that's why I

1 didn't do that.

2 Q. And again, that's because you're assuming
3 there were not any changes in what was causing the
4 increased mortality over that period of time.
5 Correct?

6 MR. ARBITBLIT: Objection.

7 A. I am assuming that the contribution of
8 synthetic opioids in terms of the percentage
9 increase in drug overdose death was similar after
10 2015 than pre-- 2013, essentially.

11 Q. Have there been any changes since 2015 in
12 the ways in which illicit fentanyl is -- is sold on
13 the streets or the forms in which it appears?

14 A. Can you give an example of that?

15 Q. Sure. An example would be -- you
16 testified, I think, earlier fentanyl being
17 available as an adulterant in heroin. Are you
18 aware that there are also prescription -- sorry,
19 excuse me.

20 -- that there are counterfeit
21 prescription pills made to resemble a prescription
22 opioid that are often laced with fentanyl and cause
23 death?

24 A. I am aware that there are counterfeit

1 prescription opioids and that some of them have
2 fentanyl in them.

3 Q. And are you aware that people have
4 overdosed and died from pills like that?

5 A. Yes, I have -- I'm aware that that occurs.

6 Q. In forming your conservative estimate of
7 the OUD population in Cabell/Huntington, did you
8 investigate whether or not these types of
9 counterfeit pills were more -- more available after
10 2015 than they were in 2015?

11 A. Again, that -- that wouldn't change my
12 estimate if they were more available versus less
13 available, as long as the pre/post fentanyl
14 introduction multiplier is -- is the accurate
15 multiplier, which is the one that I've used.

16 So because there are more fentanyl
17 deaths, what matters in terms of the validity of
18 the estimation, is the probability of death
19 per use.

20 Q. And is carfentanil more potent than what
21 was generally referred to as synthetic fentanyl
22 when fentanyl first appeared?

23 A. I would need to look at -- there are a
24 number of different synthetic opioids. I was

1 assuming kind of an average of them.

2 Q. Okay. Well, I've already asked whether you
3 know if carfentanil is -- is present and available
4 in 2015. But my question more specifically was:
5 Do you know whether or not carfentanil is more
6 potent and therefore considered more dangerous than
7 other synthetic fentanyl?

8 A. I would have to look at the range of all
9 synthetic fentanyl. Carfentanil is very potent.
10 But you know, if you want to show me some data on
11 the potency of various synthetic opioids, I can
12 answer your question. But just carfentanil
13 compared to a random synthetic opioid, I don't have
14 -- I can't -- that's not sufficiently specific to
15 answer your question.

16 Q. Okay. Can you open -- let me just make
17 sure I have the number correct.

18 -- Exhibit 86?

19 KEYES DEPOSITION EXHIBIT NO. 86

20 ("Underlying Factors in Drug Overdose
21 Deaths" by Dowell, et al. dated
22 12-19-17 was marked for identification
23 purposes as Keyes Deposition Exhibit
24 No. 86.)

1 Q. This is the Dowell paper that we were
2 speaking of a moment ago, Exhibit 86?

3 A. Yes.

4 Q. And that's the paper that -- you list it at
5 No. 195 in your reference material; is that
6 correct?

7 A. That's right.

8 Q. And if you turn to the fourth page, am I
9 right that the basis for your multiplier is an
10 approximation of the information that's presented
11 at -- in the first draft on page 4 of this paper.
12 Is that right?

13 A. That's part of it. I have another citation
14 as well.

15 Q. Your Citation 194, correct?

16 A. Let me -- that's right.

17 Q. Okay. So just so I understand first, so
18 the basis for this multiplier of three is that as
19 you see the calculation of illicit opiate overdose
20 deaths from 2011 through 2015 increased in the
21 neighborhood of two deaths per 100,000 up to around
22 but a little bit above six deaths per 100,000,
23 correct?

24 A. That's right.

1 Q. Okay. I take it based on some of your
2 prior answers, you are aware that that metric,
3 deaths per 100,000, increased from 2015 to 2016.
4 Correct?

5 A. Again, I'm aware of that. But the correct
6 calculation is the comparison of 2011 to 2015. I
7 mean, the other reference I cite here, the
8 synthetic opioid overdose data, also goes up to
9 2018. But it would be incorrect to use a
10 multiplier comparing 2018 to 2011. That's why I
11 did not do that.

12 Q. That wasn't my question. My question was:
13 You are aware that from 2015 to 2016, it increased,
14 correct?

15 A. Yes.

16 Q. And you're also aware that that same metric
17 increased from 2016 to 2017, correct?

18 A. Yes. It increased 2016 to 2017.

19 Q. And it further increased from 2017 to 2018,
20 correct?

21 A. For illicit opioid overdose deaths? I
22 would need to check the data to confirm that.

23 Q. Okay. Well, we can find information on
24 that at the web page you've listed on -- as

1 Reference No. 194, correct?

2 A. That information would be on Reference 194.

3 Q. As you sit here, do you recall what that
4 resource says was the West Virginia-specific
5 mortality -- or deaths per 100,000 in 2018?

6 A. I don't recall sitting here.

7 Q. As you sit here today, do you believe that
8 number to be higher or lower than the six per
9 100,000 that's reflected in the Dowell paper?

10 A. I would need to review the data.

11 Q. Okay. Do you know where within the ranking
12 of states that figure for West Virginia ranks as
13 among -- among all states?

14 A. I don't recall. I'm sorry.

15 Q. And is it your testimony that the higher
16 rate of deaths per 100,000 as of 2018, that is not
17 in any way the result of differences in the
18 availability and frequency with which fentanyl is
19 present in various drugs of abuse?

20 MR. ARBITBLIT: Objection.

21 A. That's not my testimony.

22 Q. Okay. Is your testimony that if there had
23 been differences and changes in the availability
24 and frequency with which fentanyl is present in

1 various drugs of abuse, that that wouldn't be
2 relevant to your calculation of OUD population
3 based on the number of deaths occurring?

4 A. That's also not my testimony.

5 Q. Well, then what is your testimony as to why
6 the higher rate of death per 100,000 as of 2018 --
7 why that is not apparently considered at all in the
8 calculation?

9 A. So I can --

10 MR. ARBITBLIT: Objection. Asked and
11 answered.

12 THE DEPONENT: Right.

13 A. I -- my testimony is not -- so you said
14 that my testimony is that had there been any
15 differences or any changes in the availability and
16 frequency with which fentanyl was present, it
17 wouldn't be relevant. That's not what I'm saying.

18 I'm saying that based on the
19 information that I have, I don't -- I didn't find
20 any changes in or differences in availability or
21 frequency that were relevant. Not that there were
22 no changes that could have been relevant.

23 I did not find any changes that were
24 relevant to my calculation. Had I found such

1 changes, I would have changed my calculation.

2 Q. Okay. I think what you testified was, you
3 used the multiplier of three ending in 2015 because
4 that was the period immediately before and after
5 the change. Right?

6 A. That's right.

7 Q. Okay. And so my question is: If there
8 were further changes after 2015, wouldn't that mean
9 that your multiplier is not capturing the
10 relevant --

11 A. No.

12 Q. -- changes?

13 A. I feel that I've answered this question now
14 a number of times.

15 Q. Well, I --

16 A. No.

17 Q. -- respect -- I think you may have
18 misunderstood. That's why I clarified the nature
19 of my question. So can you answer that question
20 now?

21 MR. ARBITBLIT: Objection, asked and
22 answered multiple times.

23 If you have anything additional to say
24 about it, you can.

1 A. Can you ask your question again?

2 Q. Sure. You had told me that the reason you
3 stuck with 2015 deaths per 100,000 even though you
4 knew that there were higher estimates for later
5 years and even though you fully understand that
6 using those higher estimates would reduce your OUD
7 population, that the reason for that is you wanted
8 to have a multiplier to capture the period of the
9 year before and after the change.

10 So my question was: If there were
11 further changes in the availability, the potency,
12 the number of ways in which it appeared, the
13 transparency with which it appeared, if any or all
14 of those things changed subsequent to 2015, would
15 your multiplier really be picking up, as you put
16 it, the change?

17 MR. ARBITBLIT: Objection, vague,
18 ambiguous, argumentative, compound, asked and
19 answered.

20 A. No. That's the short answer to your
21 question, is no. The correct calculation would be
22 2011 to 2015 because the calculation is not
23 capturing -- the purpose of the calculation is not
24 to capture the change from one time to another;

1 it's to estimate the change in the probability of
2 drug overdose death, given a change in the
3 underlying death rate.

4 And so the appropriate way to calculate
5 that using the methodology that is reliable in my
6 field would be to use a pre/post comparison in an
7 interrupted time series, which is what I did.

8 If there are further changes after
9 2015, it would be biased to include that as part of
10 my interrupted time series.

11 So the way you are describing the
12 methodology would be incorrect. The way I'm
13 describing the methodology is correct under the
14 reliable methods of my field.

15 Q. So let me just make sure I understand that.
16 If there were further changes in how dangerous
17 illicit fentanyl was as measured by the number of
18 deaths it caused per 100,000, that would not be
19 relevant to your estimate of the OUD population
20 based upon the number of deaths attributed to
21 fentanyl?

22 MR. ARBITBLIT: Objection.

23 A. I don't know how to describe this
24 methodology again. Changes in --

1 Q. That's not what I asked you to do. I asked
2 you a question. I'd like you to answer my
3 question.

4 A. Okay.

5 MR. ARBITBLIT: Asked and answered
6 multiple times. You're badgering at this point.

7 You want an answer to a question,
8 you've got the answer several times.

9 A. Could you rephrase the question?

10 Q. Can you --

11 A. I don't understand the question.

12 Q. If there had been changes subsequent to
13 2015 in the dangerous nature of illicit fentanyl
14 such that it is more dangerous today than it was in
15 2015, then for purposes of estimating the OUD
16 population based on the number of deaths attributed
17 to fentanyl, don't you need to take into account
18 those changes subsequent to 2015?

19 MR. ARBITBLIT: Objection.

20 A. No.

21 MR. ARBITBLIT: Asked and answered.

22 Q. Okay. I want to ask you some questions
23 that relate to your calculation of deaths that you
24 say are directly and indirectly attributable to

1 prescription opioids. And first, I just want to
2 understand something -- a few things about the
3 mechanics of this -- this calculation.

4 So you've described in earlier
5 testimony, if a prescription opioid was noted at
6 all being present, then for purposes of your
7 methodology, you coded that death as either T40.2
8 or T40.3, depending on which substance was found to
9 be present. Is that fair?

10 A. That's right.

11 Q. And so what about when there were T40.1 and
12 T40.4 -- and just for purposes of this, I will --
13 I'll confine my questions to after 2013.

14 If both T40.1 and T40.4 were present
15 but T40.2 and T40.3 were not present, did you
16 choose one or the other as between T40.1 and T40.4?

17 A. Can you refer me to the section of the
18 report where this is described?

19 Q. Sure. I'm on page 32. Sorry, 33.

20 A. Page 33?

21 Q. I am on page 33 where at the top you
22 describe all the various ICD-10 codes and how you
23 use them, but I'm also referring to testimony you
24 gave earlier here today. I'm not suggesting that

1 all of this is disclosed in your report. That's
2 partly why I'm asking the question.

3 A. Okay. Okay, so your -- so -- let me just
4 go back to your question.

5 Q. Let me back you, because I think I may have
6 lost you in my question. We established in your
7 earlier testimony - and I think you just
8 reconfirmed for me - if a prescription opioid was
9 present at all, then for purposes of the
10 calculation you are doing here for Figure 8 and
11 Figure 16, you classified that by the prescription
12 opioid rather than by other opioids that were
13 present. Correct?

14 A. That's correct.

15 Q. Okay. So my question is: If there were
16 multiple substances but not T40.2 and T40.3, it was
17 heroin and fentanyl that were present -- which I
18 think you've testified, that is a circumstance at
19 which people have overdosed and died, from the
20 combination of heroin and fentanyl. Correct?

21 A. That's right.

22 Q. Okay. So for those deaths, the death
23 certificate would say, T40.1, heroin and T40.4,
24 fentanyl. And my question is: Did you put those

1 deaths into one column or the other? And if so,
2 which one?

3 A. One column -- which -- which two columns am
4 I considering?

5 Q. As between heroin and fentanyl, T40.1 and
6 T40.4. If both were noted as present but no
7 prescription opioid.

8 A. I see. So for T40.4 -- oh, when they both
9 were present, we used a -- I used a correction for
10 fentanyl. Most likely that was in -- that was in
11 the bucket of not prescription opioids, although
12 some portion of fentanyl deaths are due to
13 prescription fentanyl, and so I estimated that
14 based on the available literature.

15 Q. Okay. I'm going to -- I'm going to ask you
16 all about that estimation in a minute. I just
17 meant in terms of where you were coding the result.
18 Is it correct that if both heroin and fentanyl were
19 present and therefore you had both T40.1 and
20 T40.4 --

21 A. Uh-huh.

22 Q. -- did you choose one of those or the other
23 in order -- for categorizing those, or did you use
24 -- did you include them under both columns?

1 A. Which columns? Is there a specific figure
2 that you're referring to?

3 Q. I --

4 A. The direct and indirect attribution?

5 Q. I'm referring, in part, to -- let me back
6 this up. You performed -- I think disclosed in
7 your work papers, various calculations that are
8 based upon how you have categorized deaths
9 available through the CDC WONDER data, correct?

10 A. Yes.

11 Q. And some of those calculations are
12 dependent upon ratios of who -- of deaths that you
13 put in the T40.2 versus T40.3 versus T40.4,
14 correct?

15 A. No.

16 Q. There's not a calculation that is a ratio
17 of that?

18 A. I'm sorry, what's the ratio? Ratio to --
19 no, T40.2 and 3, I included together to estimate
20 the rate of prescription opioid overdose.

21 Q. Right. I'm asking you --

22 A. The rest of the opioid overdoses were not
23 prescription opioid --

24 Q. You're way ahead of me. I'm asking a more

1 foundational question of: In building up the data
2 that is then going to be the product of these
3 calculations, you have deaths that you put into the
4 different categories. Some you coded at T40.1;
5 some you coded at T40.2.

6 A. No, these not how it works, because they
7 are not mutually exclusive. You are raising the
8 exact reason why that would not be a reliable
9 methodology.

10 Q. I want to make sure I understand you.
11 They're not mutually exclusive, because if -- I
12 think I missed -- I think your earlier testimony on
13 this is different. If prescription opioids were
14 present - you have T40.2 or T40.3 - but also heroin
15 is present --

16 A. Right.

17 Q. -- does that result in multiple entries, or
18 does that result in a single entry that's in just
19 one column?

20 A. I'm -- I'm having a hard time with the
21 column concept. I wonder if you can point me to a
22 figure or a -- in terms of how this resulted in the
23 -- I'm truly just confused. I'm not trying to be
24 obstructionist in any way.

1 But I don't think that the way you're
2 describing it reflects how I did it.

3 Q. Okay. Do you recall producing an Excel
4 workbook as part of your backup material?

5 A. Yes.

6 Q. Okay. Do you recall that that workbook has
7 a tab titled "Figure 8" and "Figure 16"?

8 A. Yes.

9 Q. And that tab further has various rows and
10 columns of information, right?

11 A. Yes.

12 Q. And do you recall that there is a row -- a
13 Column J that is in the descriptive part, it's
14 populated as "T40.2 through T40.4 minus T40.2 and
15 T40.3," which really just means it's T40.4.

16 A. Right.

17 MR. ARBITBLIT: I'm going to object to
18 the line of questioning without a document that the
19 witness can look at. It's very unfair. If you
20 wanted to question on this, it should be in the box
21 of exhibits.

22 You're asking her to testify from
23 memory about a document with many tables and
24 figures, and it's just not appropriate.

1 Q. Doctor Keyes, did you perform your own
2 calculations in this matter?

3 A. I worked with my research assistant.

4 Q. Did you review the calculations that were
5 performed in this matter?

6 A. I did.

7 Q. Do you have a working understanding of how
8 the calculations were performed?

9 A. No, to be honest with you, I don't. If
10 there's a specific subtraction that -- in a
11 specific column of one specific Excel spreadsheet
12 -- I performed a lot of analyses to come up with
13 these estimates, and I would need to see what
14 specifically you're referring to.

15 Q. Well, I'd be happy to provide it, I'm not
16 trying to do it by ambush. I knew that there were
17 a lot of exhibits that had been -- had been sent
18 out. I wasn't aware until today that this Excel
19 spreadsheet was not one of them.

20 If you'd like, I can e-mail the
21 spreadsheet. But I'm asking you about what was
22 disclosed to us as your -- your backup Excel file,
23 with your calculations, and I just -- I have some
24 questions --

1 A. I know but you're asking me about specific
2 columns and I'm -- I need something to go off of.

3 Q. Sure. I'd be happy to show you the Excel
4 file, and -- why don't we briefly go off the
5 record. It's something --

6 MR. ARBITBLIT: We're not doing that.
7 You're --

8 MR. METZ: Okay, then I'll continue to
9 ask her questions about her calculations.

10 MR. ARBITBLIT: But did you read the
11 protocol about providing exhibits 48 hours ahead of
12 the deposition? It doesn't say anything about
13 e-mailing them during a deposition. If you find --
14 if you find authority for what you're proposing,
15 then I'd be happy to -- to consider it.

16 But the authority I've seen says you're
17 two days late.

18 MR. METZ: Don, I'm only proposing to
19 do what you've asked for. I'm perfectly content to
20 continue finding out whether this witness knows how
21 these calculation were put together just by asking
22 her working knowledge of them.

23 You and she both requested to see the
24 file I'm looking at. And if you'd like, I can send

1 that to you. If you're going to complain about me
2 offering to do that, I won't send it to you and
3 I'll continue asking my questions.

4 MR. ARBITBLIT: You can ask your
5 questions, but the witness is within her rights not
6 to be able to not answer them without seeing what
7 you're talking about.

8 MR. METZ: Okay, you and I have a
9 different view about what experts can be asked
10 about.

11 MR. ARBITBLIT: I didn't say you
12 couldn't ask.

13 BY MR. METZ:

14 Q. Doctor Keyes, do you have a working
15 knowledge of the calculations that you produced for
16 your Figure 8, how they were put together?

17 A. Yes.

18 Q. Does that calculation at any point include
19 a -- the creation of a percentage that is the
20 percentage of deaths coded T40.4 as a share of
21 deaths coded T40.2, T40.3 and T40.4 combined. Yes
22 or no.

23 MR. ARBITBLIT: Objection.

24 A. The Figure 8?

1 Q. Yes.

2 A. So what we did for Figure 8 was T40.2,
3 T40.3 and a portion of T40.4.

4 Q. Do you know how you arrived at the portion?

5 A. Yes, I do.

6 Q. How did you arrive at the portion?

7 A. We estimated the pre-illicit fentanyl share
8 of prescription opioid overdose deaths that were
9 due to T40.4 and applied that share thereafter. I
10 attributed those deaths to prescription opioids.

11 Q. Okay. In coming up with that share, are
12 deaths that are coded T40.4, are they exclusive of
13 -- that same death can't appear as T40.2 or T40.3,
14 can it?

15 MR. ARBITBLIT: Objection.

16 A. That's right.

17 Q. Okay. And so getting back to the question
18 I was trying to ask before, you've described the
19 default rule that you would use if T40.2 or T40.3
20 was present, you would code that death as one or
21 the other of those.

22 But my question was: If they are not
23 present, you only have T40.1 and you only have
24 T40.4. Did you have a default rule that you

1 applied as to which way that death would be coded
2 the one time that it's coded?

3 MR. ARBITBLIT: Objection.

4 A. T40.4 is not in Figure 8. That's what I'm
5 confused about.

6 Q. Well --

7 A. I mean, T40.1 is not in Figure 8.

8 Q. Right.

9 A. So if it's coded T40.1 and T40.4, it's
10 coded T40.4, so the same rule that's described in
11 the report was applied.

12 Q. Okay. And you have a Figure 16, correct?

13 A. Do you want me to go to Figure 16?

14 Q. I'm asking, do you know that you have a
15 Figure 16?

16 A. I do know that I have a Figure 16.

17 Q. Okay. Does the calculation that produces
18 your Figure 16 include T40.1?

19 A. Yes, Figure 16 does include T40.1.

20 Q. Okay. So just going back to my prior
21 answer -- my prior question: For purposes of your
22 Figure 16, when you were deciding whether something
23 belonged in the bucket of T40.1 versus T40.4, if
24 both were present - which again, there is a

1 circumstance in which there was heroin and fentanyl
2 both present - did you have a default rule that you
3 used in order to decide whether that death would be
4 coded as fentanyl versus coded as heroin?

5 A. I would need to look at the spreadsheet to
6 know exactly what mathematical formula that we
7 applied.

8 Q. Okay. I don't believe that information is
9 available in the spreadsheet. So my question is
10 simply: As you sit here, you do not know whether a
11 death certificate that was coded as both heroin and
12 fentanyl, whether that - for purposes of your
13 analytics - was listed as a heroin death or a
14 fentanyl death?

15 A. I believe I've been very transparent with
16 my methodology, so if a -- if a death has T40.1 and
17 T40.4, then the share of the T40.4 deaths that were
18 the pre-2013 deaths would be applied to that. That
19 death could only be -- that death could be
20 considered directly or indirectly attributable to
21 prescription opioids based on a proportionate share
22 from the pre-2013 T40.4 deaths.

23 So it's -- I think the question is a
24 little bit too simplistic of which bucket did T40.1

1 and T40.4 deaths go, because it was based on this
2 mathematical calculation.

3 Q. Is that true, what you just told me, for
4 time periods prior to 2012?

5 MR. ARBITBLIT: Objection.

6 A. Prior to 20 -- prior to 2012, T40.4 deaths
7 were considered prescription opioid deaths.

8 Q. And if it was a T40.1 and a T40.4 both
9 present, you would call that a T40.4 death, a
10 fentanyl death, rather than a heroin death. Is
11 that fair?

12 MR. ARBITBLIT: Objection.

13 A. I didn't call anything a fentanyl death. I
14 attributed that death to prescription opioids.

15 Q. Well, but specifically for purposes of your
16 calculation, you attributed it as a T40.4; is that
17 right?

18 MR. ARBITBLIT: Objection.

19 A. I --

20 MR. ARBITBLIT: Vague.

21 A. I didn't do that. I didn't attribute
22 anything to T40.4. I attributed things to
23 prescription opioids or not prescription opioids.

24 Q. Okay. I'll move on.

1 Now, you've described for purposes of
2 calculating your Figure 8 that that is the before
3 2013 share of overdose deaths that was attributable
4 to -- to -- to what you would understand to be
5 prescription fentanyl. Is that a fair summation of
6 what Figure 8 represents?

7 A. I considered T40.4 deaths to be
8 prescription opioid deaths prior to 2013.

9 Q. Okay. And sorry I wasn't clear. So then
10 for 2013 forward, you've not just been able to take
11 the total that is coded T40.4 because you
12 understand some number of those are illicit
13 fentanyl deaths, they're not prescription fentanyl
14 deaths, right?

15 A. That's right.

16 Q. Sorry, I couldn't hear you. Was that a
17 yes?

18 A. Yes, that's right. That's right.

19 Q. And so you were starting to describe this
20 calculation that you perform in order to attribute
21 going forward some number of those -- that T40.4
22 category to -- to prescription opioids, and so my
23 questions are going to relate to that. I want to
24 understand better the logic of the calculation.

1 A. Sure.

2 Q. So when you calc -- first of all, is it
3 correct that in order to come up with the share
4 that you're attributing to prescription fentanyl,
5 your first step is to calculate a ratio of T40.4
6 deaths as a function of T40.2, T40.3 and T40.4
7 combined.

8 A. That's right. .

9 Q. And --

10 A. Wait, I'm sorry, actually, I don't think
11 that's quite right. I would have to look at the
12 spreadsheet. I'm sorry. I think that we did some
13 manipulation to the -- to account for deaths that
14 had T40.2 and T40.3 as well as T40.4, so I don't
15 think the way you've described it as exactly what
16 we did.

17 Q. Okay. If you'll accept -- well, let me
18 just ask it a different way. However you would
19 more precisely phrase that, there is a step in your
20 calculation in which you come up with a percentage
21 that T40.4 represented as a function of some other
22 prescription opioids. You may have made some
23 adjustment to it.

24 But isn't that correct, that that is

1 one step in your calculation?

2 A. Yes.

3 Q. Is that correct?

4 A. That's correct.

5 Q. Okay. And if it would help -- I think this
6 is described in text on page 33 of your report --

7 A. Yeah, I was referring to that.

8 Q. -- where you say -- right, "I estimated the
9 rate of synthetic opioid deaths from 1999 to 2012,
10 and applied that rate to synthetic opioids over
11 those deaths from 2013 and onwards as a estimate of
12 the number of synthetic" "deaths." Correct?

13 A. That's correct.

14 Q. Okay. So then when you -- and do you
15 recall -- do you recall what that rate was,
16 approximately?

17 MR. ARBITBLIT: Objection.

18 A. Not off the top of my head.

19 Q. Okay. Off the top of your head, do you
20 know whether in calculating that rate you took a
21 weighted average of the deaths?

22 A. I considered doing a year-to-year average,
23 but the numbers were unreliable for on a
24 year-to-year basis, and so I summed the total

1 period from 1999 to 2012 to get a more
2 statistically reliable estimate.

3 Q. It's more statistically reliable to sum all
4 the deaths and then take the percentage, correct?

5 MR. ARBITBLIT: Objection.

6 Q. Maybe I misunderstood. I just wanted to
7 make sure I understood correctly what you said you
8 did to get a more reliable estimate.

9 A. Maybe you could be more clear what you mean
10 by a "weighted average."

11 Q. Yeah, all I meant was to calculate what you
12 described in your -- the text of your report as a
13 rate, you took -- you formed that rate as a
14 function of all deaths from 1999 through 2012
15 rather than doing it, as you described, year by
16 year. Is that fair?

17 A. (Nodded affirmatively).

18 Q. Okay. And that approach is taking them all
19 together, as opposed to doing it year by year, I
20 think you just testified that's the more reliable
21 way to do that, correct?

22 A. I did it both ways, and it didn't make a
23 difference in my final calculation, and I felt that
24 the overall period provided a more reliable

1 estimate.

2 Q. Yeah. Would it surprise you to know that
3 in fact you did the opposite?

4 A. I'm sorry, I -- I'm not understanding.

5 Q. Okay. Now, you then used this rate that
6 you calculated to estimate going forward the number
7 of deaths coded as T40.4 that are -- that continue
8 to be attributable to prescription opioids, in your
9 opinion. Is that correct?

10 A. As an estimate, yes.

11 Q. Okay. And you do that for the years 2013
12 through 2018; is that right?

13 A. That's right.

14 Q. And explain to me why -- or how is the rate
15 of -- at which prescription opioids -- the rate
16 that that made up of all -- sorry, back this up.

17 Explain to me how the percentage share
18 of prescription opioid deaths that was attributable
19 to prescription fentanyl prior to 2012, how that
20 statistic in any way predictive of the share of
21 T40.4 deaths, so synthetic only, that were the
22 result of prescription fentanyl.

23 Can you explain the logic of that to
24 me?

1 A. Sure. Well, to back up, I did the
2 calculations several ways, including estimating
3 post-2013, using the same sort of denominator, if
4 you will, of all prescription opioid deaths that
5 were T40.4 and estimated that as a function of the
6 number that would potentially be attributable to
7 prescription opioids, and then estimated the total
8 number of T40.4 deaths - which is the number of
9 deaths that I was interested - how many of those
10 would be attributable to prescription opioids, and
11 the results were similar no matter how you applied
12 that estimate post-2013, but my interest was in the
13 fentanyl deaths, and so I applied the percentage to
14 the -- to the fentanyl deaths specifically, because
15 those are the deaths that I was interested in
16 identifying an estimate of the number that would be
17 due to prescriptions.

18 Q. But how -- given the manner in which you
19 calculated the percentage, how was it informative
20 of the share of T40.4 deaths that are prescription
21 fentanyl versus illicit fentanyl? Is it your
22 testimony that the ratio you calculated is somehow
23 informative of that question? And if so, how?

24 A. So as an example, if prior to 2013 there

1 were 100 prescription opioid deaths and two of them
2 were prescription fentanyl deaths, if there were
3 100 fentanyl deaths after 2013, I would estimate
4 that two of those would be prescription fentanyl
5 deaths.

6 Q. And if there were 400 fentanyl deaths, you
7 would -- you would estimate that eight were
8 prescription fentanyl, correct?

9 A. I'm sorry?

10 Q. Under that same logic you just described,
11 if there were 400 prescription fentanyl deaths, you
12 -- your logic would lead you to conclude to eight
13 were the result of prescription deaths.

14 A. Using that calculation, that would be the
15 -- that would be the estimate.

16 Q. Okay. And if there were -- and if we
17 doubled the number of deaths again, solely within
18 the category of synthetic -- synthetic opioids, you
19 would continue to calculate that that ratio would
20 hold, no matter --

21 A. Yes.

22 Q. -- how many additional deaths there were --

23 A. It stays the same.

24 Q. -- a certain percentage will always be the

1 result of prescription opioids versus illicit --
2 prescription fentanyl versus illicit fentanyl?

3 A. It's a relatively moot point, because I did
4 it a number of different ways, and the results were
5 robust to the type of correction that you did.

6 But I applied the correction to the
7 T40.4 deaths overall.

8 Q. What sensitivity tests did you perform on
9 this calculation?

10 A. As I mentioned, I looked at the T40.4
11 deaths as a function of overall prescription opioid
12 deaths as well.

13 Q. Are you relying on that calculation for the
14 robustness that you just testified to?

15 A. I don't -- I guess I don't understand what
16 you mean by that.

17 Q. Well, that calculation hasn't been
18 disclosed to us, so my question is: Are you
19 relying on that for purposes of what you just
20 explained was your belief that this is a -- the
21 issue I'm describing -- discussing doesn't matter
22 because you got the same results no matter how you
23 did it so --

24 A. So --

1 Q. -- are you relying on that other
2 calculation to support that statement?

3 A. In the course of due diligence in
4 epidemiology, we routinely do a range of different
5 sensitivity analyses on the robustness of our
6 results. That's just what we do in the course of
7 our calculations.

8 So I rely on the estimate that I
9 provided in the report, and I also - because I'm an
10 epidemiologist - I tested the robustness of it
11 using multiple different approaches.

12 Q. And did you retain --

13 A. So I --

14 Q. And did you retain those robustness and
15 sensitivity analyses?

16 A. We were -- I'm sure I did.

17 Q. And have they been produced to the
18 defendants in this litigation?

19 A. I was asked to produce the calculations
20 that went into the report. I routinely do
21 sensitivity analyses on my estimates. So no, I
22 have not produced the sensitivity analyses.

23 Q. Okay. Back to my original question: How
24 is the rate at which T40.4 was present among T40.2,

1 T40.3 and T40.4, how does that rate inform at all
2 the question of how much of T40.4 is then made up
3 of prescription fentanyl versus illicit fentanyl?

4 How is the one informative of the
5 other?

6 A. I would answer it the same way as when you
7 previously asked it: That that is the population
8 that we're interested in estimating this percentage
9 within, and that's routinely done in epidemiology.

10 Q. Well, I understand that that's the question
11 you want to answer. But why does that ratio
12 provide you that answer?

13 MR. ARBITBLIT: Objection,
14 argumentative, asked and answered.

15 A. I think I've explained it. It's the T40 --
16 the T40.4 deaths, we wanted the share of those that
17 were due to prescription opioids. We knew the
18 share of prescription opioid deaths that were due
19 to fentanyl in a prior period, and so applied that
20 share to the T40.4 deaths, which was the subgroup
21 that we were specifically interested in.

22 Q. And -- but you understand that after 2013
23 that the subgroup of prescription fentanyl and
24 illicit fentanyl -- you understand that, correct?

1 A. I understand that T40.4 is synthetic opioid
2 death.

3 Q. And that after 2013, it's inclusive of
4 illicit fentanyl as well as you assumed some
5 prescription fentanyl. Correct?

6 A. I would say synthetic opioids. But yes,
7 it's going to be a mix of illicit and licit.

8 Q. And it's your testimony, as a reasonable
9 epidemiologist, that you can look at the population
10 at which prescription fentanyl was present, among
11 other prescription opioids, and that will tell you
12 how much prescription fentanyl was present among
13 prescription fentanyl and illicit fentanyl. That's
14 your testimony?

15 A. That's one way to estimate that portion. I
16 did it a number of different ways. None of them
17 made a difference in terms of my opinion or
18 materially to the calculation, and I think it's
19 routine in epidemiology to, for example, apply an
20 estimate of risk to the subgroup at risk to try to
21 get an estimate of the total number.

22 Q. Is it routine in epidemiology to have a
23 hypothesis in mind when using statistical analysis,
24 as to how one number might be determinative of some

1 other number? Is that routine?

2 MR. ARBITBLIT: Objection.

3 A. I'm not understanding what the question
4 means. To have a hypothesis -- what do you mean by
5 "a hypothesis"?

6 Q. Do you ever use the term "hypothesis" in
7 connection with statistical analysis?

8 A. I do.

9 Q. And what do you use it to mean?

10 A. I would hypothesize that prescription
11 opioid use causes heroin use, for example. It's
12 usually -- a hypothesis is about a cause or a
13 causal connection.

14 Q. And is it important to have a hypothesis
15 when interpreting statistical information? To then
16 base further conclusions on.

17 MR. ARBITBLIT: Objection.

18 A. I wouldn't make a blanket statement like
19 that.

20 Q. Okay. Would you agree or disagree with the
21 statement that "One must infer that a causal
22 relationship exists on the basis of an underlying
23 causal theory that explains the relationship
24 between two variables?"

1 MR. ARBITBLIT: Objection.

2 Q. Would you agree with that as a blanket
3 statement?

4 MR. ARBITBLIT: Objection.

5 A. No, I wouldn't agree with that as a blanket
6 statement.

7 Q. And certainly that's not consistent with
8 the principles you applied in performing this
9 calculation, right?

10 MR. ARBITBLIT: Objection.

11 A. I don't --

12 MR. ARBITBLIT: Vague.

13 A. It's not consistent or inconsistent. I
14 don't see the relevance.

15 Q. Back to your calculation that you used to
16 produce Figure 8 - and also, then, therefore Figure
17 16 - am I correct that you used West Virginia
18 statewide death totals as the basis for the
19 calculation that you performed?

20 A. For the West Virginia rates, yes.

21 Q. Well, and am I correct that you then
22 applied that West Virginia rate to -- within Cabell
23 and Huntington, but you didn't estimate a separate
24 Cabell and Huntington rate, correct?

1 A. For the death rates, we had data on Cabell
2 for a number of years.

3 Q. Right. I'm just asking you if you used it
4 for purposes of calculating the rate that you
5 attributed to prescription fentanyl. Is that how
6 you performed the calculation?

7 A. Can you just be specific about what rate
8 you mean? Because there's a lot of rates in Figure
9 8.

10 Q. The rates we've been talking about that are
11 discussed at page 33 of your report. It's the rate
12 of prescription fentanyl and the share of other
13 prescription opioids.

14 A. Yes.

15 Q. Do you recall whether you calculated that
16 rate on the basis of West Virginia-specific data or
17 Cabell and -- Cabell County-specific data?

18 A. I would need to look at the spreadsheet.

19 Q. Okay. Sticking with the West Virginia
20 piece of it, do you recall approximately how many
21 deaths you attributed to prescription -- to
22 prescription fentanyl in the last year for which
23 you were using actual data, not estimated data? Do
24 you recall approximately how many deaths that was?

1 A. No.

2 Q. Would you believe me if I told you that in
3 the West Virginia portion of your calculation, you
4 -- for 2012, you had 41 deaths?

5 A. I really would need to see the -- the
6 spreadsheet.

7 Q. That's fine. You can treat this as a
8 hypothetical. I am asking about your calculation,
9 but if you want to treat it as a hypothetical, be
10 my guest. I'd like you to assume that for 2012,
11 you had 41 deaths in that category, and then you
12 begin projecting --

13 A. Could you just slow down a minute? Which
14 category? The 20 -- 2012 -- I'm sorry, just go a
15 little bit slowly so I can keep up.

16 Q. No problem. 2012, the deaths that had only
17 T40.4 as a contributing opioid. Okay? You with
18 me? The death that you --

19 A. So 2012 -- I'm assuming a hypothetical that
20 in 2012, there were 41 deaths with T40.4 --

21 Q. Correct.

22 A. -- only. No other T codes.

23 Q. Well, you've told us a little bit how
24 you've categorized things. But that's the number

1 represented in -- we'll call it hypothetically.
2 But that's in Column J, Row 36 of your
3 calculations, as deaths that had only T40.4 as a
4 contributing opioid, is how you describe it there.

5 A. I find it very difficult to follow this
6 when I'm not allowed to see the spreadsheet.

7 Q. You're more than allowed. I offered to
8 provide it. Your counsel complained about that
9 offer, and so I've not provided it. If you'd like
10 me to provide it, I'd be willing to provide it
11 right now. I suspect Mr. Arbitblit will just
12 complain again.

13 So you can have it one way or the
14 other, but you can't have it both ways.

15 A. This is difficult to --

16 Q. That's fine. Why don't I continue my
17 question. I would like for you to assume for 2012,
18 the deaths that you attributed to prescription
19 fentanyl --

20 MS. DO AMARAL: I'm sorry, Counsel,
21 can we take a moment? I don't see that
22 Mr. Arbitblit is still on --

23 MR. ARBITBLIT: I'm still on.

24 MS. DO AMARAL: We need to stop the

1 deposition for a minute? Can we take a few
2 minutes?

3 MR. ARBITBLIT: No, no, no, no I'm
4 still on.

5 MS. DO AMARAL: I'm sorry, Don, I
6 didn't see you:

7 MR. ARBITBLIT: I am still on.

8 Q. Okay, let me ask this again. For the last
9 year for which you had actual data, you had 41
10 deaths in the category of T40.4 as the contributing
11 opioid, that's the prescription fentanyl. Okay?

12 A. I had actual data on all years.

13 Q. Well, you don't for 2013 and 20-- I'm using
14 data in contrast to the years for which you
15 provided an estimate of the T40.4. Do you
16 understand my meaning now?

17 A. Sure.

18 Q. Okay. For the last year for which you only
19 used actual data, no estimated or projection, there
20 were 41 deaths in that category. Do you recall
21 approximately how many deaths your estimate put in
22 that category for the year 2017?

23 MR. ARBITBLIT: Objection.

24 A. No.

1 Q. You do not recall?

2 A. No.

3 Q. If -- I'll ask you just to assume, as a
4 hypothetical - but for the record, this is in
5 Column J, Row 41 - it's 491 deaths. So it's 450
6 more than in the last year for which you were using
7 data alone rather than a projection.

8 My question is --

9 A. I don't know that that's accurate.

10 Q. Well, I -- you can fight me on whether or
11 not it's accurate. I'm staring it at in the face.
12 I'd be happy to show it to you. But if you don't
13 believe me, take it as a hypothetical, and then
14 answer this question:

15 Do you have a theory that would explain
16 why prescription fentanyl went from killing 41
17 people in 2012 to killing 491 people five years
18 later? Do you have a theory as to why that would
19 be the case?

20 A. Prescription overdose deaths are --
21 overdose deaths are going up overall, so I would
22 need to look at the specific underlying data in
23 order to answer that question.

24 Q. Do you know whether the availability of

1 prescription fentanyl specifically increased or
2 decreased over that time period?

3 A. It decreased slightly.

4 Q. Okay. Do you know whether the potency of
5 prescription fentanyl increased, decreased or
6 stayed the same over that time period?

7 A. I don't know.

8 Q. And at least under your calculation,
9 prescription fentanyl specifically was present in
10 ten times as many overdose deaths as a result of
11 your projection and --

12 A. Again, I did the projections several
13 different ways.

14 Q. And my question is: If it's not because
15 there was more prescription fentanyl available and
16 if it's not because prescription fentanyl was more
17 potent all the sudden, is there a theory that would
18 explain why prescription fentanyl specifically was
19 now causing 12 times as many deaths as before per
20 year?

21 A. I am not offering any opinions with respect
22 to that. My only opinion is that the reliability
23 of my estimates was verified as much as I could.
24 And so this is the most reasonable and reliable

1 approach that I could -- that I decided to use.

2 Q. And some of those methods that you've just
3 described, validating the reliability of your
4 analysis, you performed additional statistical
5 calculations that lead you to that conclusion,
6 correct?

7 A. Yes. Routinely we perform many different
8 statistical calculations when we're estimating
9 trends like this.

10 Q. Now, earlier today you made reference to a
11 study that you refer to as the Allen paper? Do you
12 recall that?

13 A. I do.

14 Q. I just want to confirm. Is the title of
15 that paper "Estimating the number of people who
16 inject drugs in a rural county in Appalachia?"

17 A. Is it -- is it one of the exhibits?

18 Q. It is not one of the exhibits. Do you
19 recall that title?

20 A. Yeah, I think that that's the title.

21 Q. Okay. Do you recall whether one of the
22 co-authors of the paper was a Michael Kilkenny,
23 who's affiliated or employed by the Cabell-
24 Huntington Health Department?

1 A. I don't recall all of the co-authors of the
2 article.

3 Q. Okay. Have you ever spoken to
4 Mr. Kilkenney?

5 A. I don't recall.

6 Q. Okay. If you'll just give me one second.

7 Could you turn to page 8 of your
8 Exhibit B within your report? I have it at -- the
9 PDF, the 125th page of your report, if that will
10 help. You were testifying about this list earlier.

11 A. So -- I don't have those page numbers.
12 Exhibit B, I'm looking for?

13 Q. Well, it's your report, but then you have a
14 Materials Considered list which you titled --

15 A. Exhibit B, yes.

16 Q. Okay. And the eighth numbered page of
17 that.

18 A. I see. Yes.

19 Q. And if you look at Entry No. 134, does that
20 refresh your recollection that you spoke with
21 Mr. Kilkenney, Doctor Kilkenney?

22 A. I don't remember the conversation, to be
23 honest with you. I talked to a lot of people in
24 that community. So I don't recall the specifics of

1 the conversation, but maybe I spoke with him.

2 Q. Okay. Do you recall raising with Doctor
3 Kilkenny any criticisms of the paper, the Allen
4 paper, that he co-authored?

5 A. No.

6 Q. As you sit here today, do you have any
7 criticisms?

8 A. Yes, I -- there's a number of limitation to
9 that study.

10 Q. Okay. What --

11 A. I think it -- it's a study for some things,
12 but it's not a -- you know, it's not the end all-be
13 all of all studies.

14 Q. What are the most important limitations
15 that you can describe as you sit here today?

16 A. I would need to look at the paper. I can't
17 be -- I can't be asked about one paper of hundreds.

18 Q. Well, you just referenced "a number of
19 limitations." Are there any that stand out in your
20 mind or you simply recall believing it has
21 limitations?

22 A. I know that it's a study with limitation.
23 If I had a moment to look at the study, I could
24 tell you what the most important limitations are,

1 but I don't have it in front of me.

2 Q. Okay. Why don't we go off the record. I
3 just want to talk to my colleagues, but I think I
4 may be done.

5 VIDEO OPERATOR: Going off the record.
6 The time is 6:20 p.m.

7 (A recess was taken after which the
8 proceedings continued as follows:)

9 VIDEO OPERATOR: Now begins Media Unit
10 10 in the deposition of Katherine Keyes. We're
11 back on the record. The time is 6:27 p.m.

12 MR. METZ: Doctor Keyes, thank you for
13 your time and your testimony today. I have no
14 further questions.

15 THE DEPONENT: Thank you.

16 MR. ARBITBLIT: No questions. Are we
17 done?

18 MR. METZ: Yeah.

19 MR. HESTER: Yes, I think so. Thank
20 you Doctor Keyes.

21 THE DEPONENT: Thank you very much.

22 VIDEO OPERATOR: If there are no
23 further questions, we're off the record at
24 6:27 p.m., and this concludes today's testimony

1 given by Katherine Keyes. The total number of
2 media units used was ten and will be retained by
3 Veritext.

4 (Having indicated she would like to
5 read her deposition before filing,
6 further this deponent saith not.)

7

8 --oOo--

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1 STATE OF WEST VIRGINIA,
2 COUNTY OF JACKSON, to wit;
3

4 I, Teresa S. Evans, a Notary Public within
and for the County and State aforesaid, duly
5 commissioned and qualified, do hereby certify that
the foregoing deposition of KATHERINE KEYES was
6 duly taken by me and before me at the time and
place and for the purpose specified in the caption
7 hereof, the said witness having been by me first
duly sworn.

8
9 I do further certify that the said
deposition was correctly taken by me in shorthand
notes, and that the same were accurately written
10 out in full and reduced to typewriting and that the
witness did request to read his transcript.

11
12 I further certify that I am neither
attorney or counsel for, nor related to or employed
by, any of the parties to the action in which this
13 deposition is taken, and further that I am not a
relative or employee of any attorney or counsel
14 employed by the parties or financially interested
in the action and that the attached transcript
15 meets the requirements set forth within article
twenty-seven, chapter forty-seven of the West
16 Virginia Code.

17 My commission expires October 25, 2020.
Given under my hand this 18th day of September,
18 2020.
19

20 <%10538,Signature%>
Teresa S. Evans
RMR, CRR, RPR, WV-CCR
21
22
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Page 372

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September 18, 2020

To: Don Arbitblit

Case Name: City Of Huntington v. Amerisourcebergen Drug Corporation,
Et Al.

Veritext Reference Number: 4241600

Witness: Katherine Keyes Deposition Date: 9/15/2020

Dear Sir/Madam:

Enclosed please find a deposition transcript. Please have the witness review the transcript and note any changes or corrections on the included errata sheet, indicating the page, line number, change, and the reason for the change. Have the witness' signature notarized and forward the completed page(s) back to us at the Production address shown

above, or email to production-midwest@veritext.com.

If the errata is not returned within thirty days of your receipt of this letter, the reading and signing will be deemed waived.

Sincerely,

Production Department

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DEPOSITION REVIEW
CERTIFICATION OF WITNESS

ASSIGNMENT REFERENCE NO: 4241600

City Of Huntington v. Amerisourcebergen Drug Corp, Et Al.

DATE OF DEPOSITION: 9/15/2020

WITNESS' NAME: Katherine Keyes

In accordance with the Rules of Civil Procedure, I have read the entire transcript of my testimony or it has been read to me.

I have made no changes to the testimony as transcribed by the court reporter.

Date Katherine Keyes

Sworn to and subscribed before me, a Notary Public in and for the State and County, the referenced witness did personally appear and acknowledge that:

They have read the transcript;
They signed the foregoing Sworn Statement; and
Their execution of this Statement is of their free act and deed.

I have affixed my name and official seal

this _____ day of _____, 20____.

Notary Public

Commission Expiration Date

DEPOSITION REVIEW
CERTIFICATION OF WITNESS

ASSIGNMENT REFERENCE NO: 4241600

City Of Huntington v. Amerisourcebergen Drug Corp, Et Al.

DATE OF DEPOSITION: 9/15/2020

WITNESS' NAME: Katherine Keyes

In accordance with the Rules of Civil Procedure, I have read the entire transcript of my testimony or it has been read to me.

I have listed my changes on the attached Errata Sheet, listing page and line numbers as well as the reason(s) for the change(s).

I request that these changes be entered as part of the record of my testimony.

I have executed the Errata Sheet, as well as this Certificate, and request and authorize that both be appended to the transcript of my testimony and be incorporated therein.

Date

Katherine Keyes

Sworn to and subscribed before me, a Notary Public in and for the State and County, the referenced witness did personally appear and acknowledge that:

They have read the transcript;
They have listed all of their corrections in the appended Errata Sheet;
They signed the foregoing Sworn Statement; and
Their execution of this Statement is of their free act and deed.

I have affixed my name and official seal
this _____ day of _____, 20____.

Notary Public

Commission Expiration Date

ASSIGNMENT NO: 4241600

PAGE/LINE(S)	CHANGE	REASON
1/1	1	1

Date Katherine Keyes

SUBSCRIBED AND SWORN TO BEFORE ME THIS

DAY OF _____, 20____.

Notary Public

Commission Expiration Date

[& - 2015]

Page 1

&	10538 371:19	160 225:1	2002 7:4 289:8,23
& 2:5,8,12,15 3:5 9:12,16,19,21 60:10	106 6:19 28:5 29:3 39:7 42:3,4,11,14 155:5,7,8 163:4	17 22:14 24:19 25:1 26:4,6 32:7 34:13 35:3 45:24	2003 270:3 2005 219:2 2006 198:21 199:4
1	108 7:2 289:4,5,11 289:19	1717 2:21	199:9,16 260:14
1 8:12 13:12,13 25:6 32:9,11 35:10 46:1 186:5 186:8 236:22 263:9	10:58 99:10	175 16:2 308:15	201 306:3 307:22
1-1-19 6:9 100:14	1100 372:1	175.3 260:14	2010 6:13 31:5 288:5
1-12-15 6:16 39:17	11:00 99:7	18 5:13 21:17,19 22:1,2 259:8	2011 260:5,13,22 261:9 315:1
1-14-16 5:19 224:15	11:07 99:15	270:1,4 372:4	317:23 318:12
1.2 267:12,13,23 268:1,11 270:13	12 6:17 34:14,16 34:19 35:5,10	1820 372:2	322:12,24 326:20
1.20 265:17,20	109:9 158:21	186 260:5,21	327:6,10 331:22
10 5:3,9 48:8,10,17 48:18 50:9 99:19 99:22 168:1,24 169:5,6,20 173:7 236:11 258:18 334:22 369:10	213:4 365:19	186.6 260:13	2012 346:4,6 349:9 350:1,14 351:19
10 5:3,9 48:8,10,17 48:18 50:9 99:19 99:22 168:1,24 169:5,6,20 173:7 236:11 258:18 334:22 369:10	12-19-17 6:11 325:22	18th 371:17	361:4,10,14,16,19 361:20 362:17 364:17
100 260:5,9,10,13 260:15,21 261:1 353:1,3	125th 367:9	19 32:12 49:19	2013 5:22 210:9 236:11 269:14 270:3 323:10 334:13 345:18,22 347:3,8,10 349:11 351:11 352:3,12 352:24 353:3 356:22 357:3 363:13
100,000 285:16,17 313:13 320:12 326:21,22 327:3 328:5,9,16 329:6 331:3 332:18	12:22 151:18	19103 2:21	2014 5:12 6:22 7:4 42:9 48:15 54:13 54:22 81:8 91:24 99:21 104:6 198:21 199:20 289:9,23
100 260:5,9,10,13 260:15,21 261:1 353:1,3	12:23 151:24	194 326:15 328:1,2	2015 5:15 21:23 40:20 187:8 219:4 219:19 220:8,13 230:6 313:10 315:1 317:17,24 318:7,11,13 319:3 319:10,18,24 320:11 322:12,13
100,000 285:16,17 313:13 320:12 326:21,22 327:3 328:5,9,16 329:6 331:3 332:18	12:42 166:13	195 317:11 326:5	
1000 285:10,20,20	12:45 166:10	1990s 226:23	
10013-1413 2:7	13 201:19 212:15 212:23,24 213:3 244:3,8 245:8 253:15 271:19	1999 349:9 350:1 350:14	
102 5:7	13/27 6:13 288:5	1:22 166:19	
104 6:17 13:5,6,11 13:16,17,24 14:13 15:5 183:17 201:11,14 244:2,8	134 5:5 367:19	2	
105 39:11	14 59:6 90:9 279:20,22	2 5:3 11:3,5,9,14 22:15 45:24 51:16 58:21 59:18 137:1 137:1 217:15 221:15 245:21 312:12	
10538 371:19	15 220:21 259:23	2-1-18 7:4 289:9	
106 6:19 28:5 29:3 39:7 42:3,4,11,14 155:5,7,8 163:4	15th 1:21 8:4	20 5:13 49:20 164:13 168:1,24 169:5,6,20 173:7 255:23 256:5,6 321:22 346:6 361:14 363:13 373:16 374:22 375:22	
108 7:2 289:4,5,11 289:19	16 26:4,6 30:17 201:21 202:1 203:17 207:1,4,8,9 207:13 208:10,11 209:9 230:5,10,23 231:1 310:24 335:11 339:7 344:12,13,15,16 344:18,19,22 359:17	20001 3:6 20005 2:13	
10:58 99:10			
1100 372:1			
11:00 99:7			
11:07 99:15			
12 6:17 34:14,16 34:19 35:5,10			
1-1-19 6:9 100:14			
1-12-15 6:16 39:17			
1-14-16 5:19 224:15			
1.2 267:12,13,23 268:1,11 270:13			
1.20 265:17,20			
10 5:3,9 48:8,10,17 48:18 50:9 99:19 99:22 168:1,24 169:5,6,20 173:7 236:11 258:18 334:22 369:10			
100 260:5,9,10,13 260:15,21 261:1 353:1,3			
100,000 285:16,17 313:13 320:12 326:21,22 327:3 328:5,9,16 329:6 331:3 332:18			

[2015 - 562]

Page 2

323:10,11 324:10 324:10 325:4 326:20 327:3,6,13 330:3,8 331:3,14 331:22 332:9 333:13,15,18 2015-2016 267:23 2016 5:6 135:1,8 229:16,22 230:7 230:15 327:3,13 327:17,18 2017 5:17 6:5 209:18 218:13 317:14 327:17,18 327:19 363:22 2017-18 268:5 2017-2018 268:15 2018 236:6 243:18 243:19 245:8,20 248:15 260:11,14 261:1,9,12 263:15 318:6,17,23 319:14,18 320:11 322:14,24 327:9 327:10,19 328:5 328:16 329:6 351:12 2019 136:4 243:20 243:23,24 2020 1:22 5:4 6:18 8:4 11:7 13:9 243:21,24 371:17 371:18 372:4 208 6:2 209 5:20 21 38:21 159:10 216-523-1313 372:3 217 5:16 22 35:8 36:5 104:22,24 105:6	139:12 223 5:18 23 122:17 24 6:18 13:9 119:1 243 221:19 245 104:7 25 140:23 141:1 371:17 250 2:6 25301 2:9 25323 2:17 26 22:18 43:21 54:17 58:21 59:18 65:5 268:18 270:14 302:23 27 5:16 113:20 217:22 218:9,10 218:15,16 28 5:18 152:3,3 224:9,12,17,19 287 6:12 288 7:2 29 35:8 36:5 38:21 273:18 275:5,9 2:32 221:2 2:46 221:7 3 3 5:4 11:7 99:14 104:10 337:19 3-31-16 5:8 103:21 3.2 100:21 3.6 213:18 217:13 217:15 30 256:2,7 275:5,9 30-35 255:13,17 304 4:4 310 49:4 3100 2:21 32 334:19 324 6:10	33 220:8 334:19,20 334:21 349:6 360:11 33.3 219:5 34 5:20 210:2,5,11 210:12 211:24 35 255:15,20 256:2 256:14 36 362:2 37 6:2 209:12,13 209:20 218:5 221:10 38 6:14 33:22 3:17-01362 1:7 8:19 3:17-01665 1:13 8:19 3:52 271:10 3rd 54:9 4 4 5:5 134:21,23 135:3,6 136:8 151:23 221:22 245:18 326:11 4.9 270:3 4.9. 270:15 40 265:1 270:13,13 271:2 400 15:16 353:6,11 405 2:9 41 6:19 211:13 241:17,18 298:1 361:4,11,20 363:9 363:20 364:5,16 42 236:3,4 242:9 243:12 312:11,24 314:22 4241600 372:8 373:2 374:2 375:2 43 243:12 244:4	44114 372:2 45 136:6 258:22 45.5 198:21 199:5 199:16 450 364:5 46 6:6 100:4,4,9,16 206:18 209:9 222:21 223:1,2,10 296:24 46-47 205:3 47 5:9 205:4 209:22 210:1 211:15,18 285:10 285:17,20 48 174:2,6,12 200:12,12 205:9 341:11 49 198:19 491 364:5,17 4:00 271:8 4:01 271:15 4:48 304:22 4:57 305:3 5 5 30:23 107:12,15 121:7 130:3 166:18 213:1,9,11 213:19 217:13,15 304:18 5.4 270:3,15 50 59:8 92:13 119:4 123:18 183:3 235:14,17 235:21 261:3,7 52 163:5,6,13,14 313:12 53 284:15 54 42:22 155:12 550 15:9,13 562 50:15
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[566 - addictive]

Page 3

566 40:7 5:00 307:6 5:02 307:12	80 46:4,4,6 200:14 200:19 84 236:6 850 3:6 86 6:10 325:18,19 325:24 326:2 8:59 8:3 8th 2:6	79:9 80:7 87:15 88:11 201:24 302:11 342:6 347:10 absolutely 68:16 92:21 178:23 250:12 abuse 5:7,10,13,16 6:3,21 21:20 22:4 33:22 42:7,17 48:12,21 103:14 103:18 209:16 218:7,12,19 225:7 231:20 266:14 328:19 329:1 abusers 6:5 209:17 abusing 254:5,8 accept 170:12 348:17 accepted 217:11 309:13 321:19 access 106:1 109:12,16,16,21 109:23 110:6,6,10 110:17 133:9,9 179:23 233:10 234:7,17,18 accessibility 231:5 231:14,17,19 accommodating 302:24 account 138:4 313:2 333:17 348:13 accumulation 213:17 accurate 138:14 188:8 311:16 324:14 364:9,11	accurately 121:13 371:9 acknowledge 25:15 373:11 374:16 act 373:14 374:20 action 1:6,13,20 8:18 9:2 371:12 371:14 actions 72:6 74:9 295:4 active 227:16 activities 68:3,4 70:14 274:8,9,15 275:4,6,15,22 276:1,5,7 279:19 282:14,15 284:14 300:6 301:2 activity 112:12,24 113:2 115:4 176:17 273:21 274:2,3,12 275:19 279:7,14,16 actual 360:23 363:9,12,19 acute 27:1,1 43:4 81:14 146:18,21 adam 3:9 8:21 add 17:3 62:16 179:4 256:18 addiction 5:13 21:21 22:5 33:22 34:12 38:12 40:3 40:10,24 41:3,21 41:22,22 143:6,12 143:18 158:22 181:8 233:22,22 236:23 247:10 250:4,8 297:2,2 addictive 158:15
6	9		
6 107:10 121:5 129:24 130:3 221:6 223:20 304:18 60 50:7,7 214:14 60,000 18:1 61 258:24 259:4,19 62.8 198:21 199:21 64 218:23 259:8 270:1,4 65 104:9,14 6:20 369:6 6:27 369:11,24	9 4:3 5:7 103:9,10 103:12,17,23 265:18 268:4,11 270:14 307:11 9/15/2020 372:9 373:3 374:3 90 122:24 901 2:16 92.1 260:9,15,24 95 222:1 223:23 96 6:12 288:1,2,7 98 6:14 39:4,13,19 39:20,24 99 6:6 186:4,8 268:15 9:53 51:11 9:54 51:17		
7	a		
7 100:20 109:8,8 217:17,19 271:14 290:4 70 46:4,6 200:14 200:18 219:22 222:12 707 2:16 725 2:13 75 285:16,20	a.m. 8:3 51:11,17 99:10,15 aah 30:5 abatement 297:3,5 297:22 abeyance 57:3,9 abide 76:13 85:7 86:4 ability 86:11,15 87:9 88:8 302:17 able 56:17,24 63:23 68:9 70:11 70:19 78:3,24		
8			
8 34:14,16,19 35:4 35:10 305:2 335:10 339:7 342:16,24 343:2 344:4,7 347:2,6 359:16 360:9 367:7 8,252 259:1 8-9 248:15 8.7 219:1 8.9 245:9,12 271:21			

addition 6:16 19:8 39:16 286:14 additional 232:17 305:23 330:23 353:22 366:4 address 23:6 64:18,18 69:23 93:5 207:14 372:16 addressed 49:3 62:4 93:14 302:21 302:22 adequately 40:12 adjustment 313:1 313:8 348:23 administer 9:1 admittedly 60:12 adolescence 6:7 100:7,12 223:6 adolescents 100:23,24 223:22 adult 245:12 adulterant 238:24 239:9 323:17 adulterated 176:1 176:5,7 237:1,11 237:15,19 238:5,7 238:13 adulterating 174:15 239:12 adulteration 195:19 237:4 adults 6:12 259:1 259:5,20 288:4 290:8 291:2 advance 63:2 64:7 73:21 advantageous 94:22 adverse 32:18,22 33:1	advise 57:6 advocacy 93:4 advocates 292:13 affect 72:11 affiliated 366:23 affiliations 9:6 affirmatively 146:2 350:17 affixed 373:15 374:21 aforesaid 371:4 afternoon 305:6 age 259:8 aggregate 21:13 21:15 129:17,19 182:20 257:24 aggregated 127:24 aggregation 127:17 ago 29:15 42:3 81:19 134:19 326:2 agree 8:11 16:20 27:1 35:24 36:4 40:16 53:5 54:8 55:3 62:2 82:5,10 86:22 95:8 96:5,6 96:13 102:10,14 102:21,24 103:2,6 114:17,20 116:16 120:7 125:9 131:1 131:5 136:24 138:18 149:9 172:13 180:18 181:13 186:15 193:7 197:10 211:1 216:11,17 228:11,17,21 258:16 294:3 295:4 358:20 359:2,5	agreeable 56:11 agreed 16:9 17:1,3 17:7 agreeing 216:15 agreement 238:3 301:20 agrees 70:9 82:13 ahead 34:5 44:10 63:4 65:21 72:16 77:16 160:5 193:13 229:14 251:2 337:24 341:11 al 1:8,14 5:12,14 5:17,19,22 6:5,9 6:11,13,16,21 7:4 8:16 21:23 31:4,6 32:4 39:17 42:8 48:14 100:14 209:18 210:9 218:13 224:15 288:5 289:9 325:21 372:7 373:3 374:3 alcohol 158:19,20 255:10,21 256:3,4 256:17 alcoholism 158:12 aligning 316:14 allege 72:7 allen 206:13 208:7 208:9,15 214:13 366:11 368:3 allotted 94:19 allow 23:3 44:3 70:2,13 71:16 79:3 95:9 allowable 83:13 allowed 22:21 43:23 58:24 81:21 362:6,7	allowing 44:3 69:16 alternatives 295:16 amaral 2:4 9:15 10:17 13:23 28:17 28:21 29:10 33:20 39:6,10 51:18,24 52:3,6,13,18 56:16 57:21 58:3,7 79:20 80:19,23 83:3 223:11 362:20,24 363:5 ambiguous 331:18 ambush 340:16 amend 25:14 amerisourceberg... 1:7,14 2:18 8:16 9:18 372:6 373:3 374:3 amount 16:10 21:11 92:12 120:13 131:17 239:21,22 amounts 59:12 137:14 analgesics 6:12 43:2 44:22 45:1 81:13 288:3 analog 320:10 analogous 68:11 71:1 158:10 analogs 320:2 analogy 158:13 analyses 310:9 340:12 355:5,15 355:21,22 analysis 6:4 70:1 133:21 134:7,15 140:14 144:8,20 161:11 191:17
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[analysis - arbitblit]

Page 5

197:9,19 202:13 209:16 243:6,18 243:20 357:23 358:7 366:4 analytics 345:13 analyzed 227:8 andrew 40:1 annual 149:21 answer 14:19 16:24 17:16 25:15 36:21 69:13 70:21 81:10 85:21,22,24 91:20 93:19 109:7 126:2 129:16 147:24 151:12 162:16,18 200:4 237:12 282:11 306:3,8,14 307:20 308:2,18 309:19 310:4 325:12,15 330:19 331:20 333:2,7,8 342:6 344:21 356:6,11 356:12 364:14,23 answered 34:4 38:8,15 43:9 48:1 129:11 132:24 134:2 144:12 154:3 161:8,18 216:21 217:7 237:6 263:18 295:9 316:11 329:11 330:13,22 331:19 333:5,21 356:14 answering 17:12 answers 59:13,19 65:14 96:23 205:22 279:15 305:19 308:14 327:2	anti 284:20 anticipated 303:14 anticipating 66:7 anyway 161:14 apologies 80:23 210:2 apologize 17:12 193:21 227:19 305:10 306:11 316:13 appalachia 366:16 apparently 329:7 appear 231:6 305:10 343:13 373:11 374:15 appearance 9:9 appearances 2:1 3:1 9:6,24 appeared 324:22 331:12,13 appearing 2:2,11 2:18 3:2 appears 225:15 226:6 244:4 323:13 appended 374:11 374:18 applicable 61:8 84:2,10 86:17,21 95:5,12,18,20,22 96:1 122:12 155:22 162:15 212:9,13 286:1 application 75:4 75:10 88:22 89:7 90:4,24 97:4 98:8 applications 77:13 applied 75:24 78:8 126:3 200:22 311:22 312:19 343:9 344:1,11	345:7,18 349:10 352:11,13 354:6 356:19 359:8,22 applies 69:18 71:7 75:5,5 78:11 80:8 82:6 88:17 90:7 97:5 102:22 104:15 152:10 161:7 216:19 217:2 219:9 222:7 228:12,16 286:17 apply 44:9 67:7 72:12 78:23 84:18 89:13 93:8 96:14 96:15 100:1 101:11,17,23 102:1 150:1 165:7 165:14,21 201:1,3 210:21 211:1 213:23 217:6 220:9 222:19 224:6 225:19 226:10 229:9 231:10,12 285:6 290:22 300:23 309:20,24 311:7,9 311:14,15 312:1,4 315:19 316:9 320:21 322:23 357:19 applying 291:12 310:10 318:22 appreciate 23:23 57:10 282:2 apprised 74:1 143:6,18 approach 6:15 39:15 40:3 201:10 309:8,9,12 311:15 311:23 313:21 350:18 366:1	approaches 355:11 appropriate 59:18 60:7 63:8 64:16 68:24 82:14 127:13 148:20 161:16 197:1 303:5 332:4 339:24 appropriateness 45:14 approximately 18:1 200:13 223:23 261:5 304:18 320:24 349:16 360:20,24 363:21 approximation 326:10 april 5:15 21:23 apt 235:7 arbitblit 2:3 9:14 9:14 14:17 16:3 16:20 20:24 22:16 23:14,22 24:11 27:3,20 28:1,7 33:13,17 34:3,22 36:9,24 37:8,15 38:7,14 39:2 43:6 43:19 44:1,23 45:9,19 46:13,22 47:5,24 49:2,9 50:16 51:6 52:8 52:15,19,22 53:1 53:10,24 54:6 55:17,22 56:10 57:2,10 58:1,9,11 58:12 61:19 64:22 65:1,22 68:23 71:3 72:15 77:22 79:17 80:24 84:12
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[arbitblit - assessed]

Page 6

84:13 86:7 87:18 90:6 91:2,24 92:4 93:20 98:20 99:2 99:8 101:5,14,19 101:24 102:17,23 105:16 106:2,13 111:15,20 117:2 117:14,21 118:14 119:15 120:5 125:11 126:8,20 127:19 128:3,13 128:23 129:10,21 130:7,17 132:4 133:19 134:2,11 136:12,19 137:19 138:9,19 140:12 141:22 142:2,6,18 143:8,14 144:11 147:4,10,22 149:7 151:4,8 152:22 153:10 154:2,21 155:1 156:23 157:12 159:23 161:2,5 162:4,11 167:1 169:19 173:23 178:18 180:3,14 182:16 182:23 186:7,10 186:24 187:7,19 188:7 189:23 190:13 191:2 192:16 194:24 195:10 196:20 197:6,13 200:24 202:22 203:7 215:9,20 216:4,7 216:20 217:7,14 219:20 220:20,24 225:20 226:13 228:14 229:11,14 234:4 235:3,16	237:6,17 241:15 257:4 262:3 263:17 272:11 273:2 274:5 276:19 277:10,19 278:3,6,11,14 279:1 281:11,24 282:2 283:4 286:11 287:11 294:15 295:8,17 301:9 302:19 304:8 317:2 318:9 319:11 321:7,24 322:15 323:6 328:20 329:10 330:21 331:17 332:22 333:5,19 333:21 339:17 341:6,10 342:4,11 342:23 343:15 344:3 346:5,12,18 346:20 349:17 350:5 356:13 358:2,17 359:1,4 359:10,12 362:11 362:22,23 363:3,7 363:23 369:16 372:5 arch 2:21 area 19:24 78:23 79:13 144:19 167:7 178:21 220:3 240:9 242:2 257:22 283:23 areas 155:17 156:8,10,11,18 157:4,24 163:10 163:20,21 226:16 argue 44:5 arguing 44:6 162:20,20	argument 164:2 argumentative 294:16 331:18 356:14 arises 54:19 157:10 arising 38:12 41:23 288:17 arrive 112:21 343:6 arrived 132:12 343:4 arriving 131:20 arthritis 6:13 288:4 article 23:24 40:20 43:7 69:21 79:18 81:1,3,18 85:19 87:22 91:3 93:24 218:5 254:16 283:22 292:1 367:2 371:15 article's 43:20 articles 50:19 55:23 56:4 57:5 59:9 61:20 62:12 71:7,14 84:19 94:4 96:9,19 161:7 303:2 articulate 70:8 articulated 61:6 ascertainable 258:6,10 aside 10:23 13:1 15:4 26:20 123:10 131:11 176:23 184:9 193:24 214:20 248:20 298:15 asked 34:3 38:7,14 43:8 47:24 59:16	72:8 78:15,16,18 85:14 101:6 129:10 134:2 144:11 151:10 154:2 161:18 215:22 216:20 217:7,24 227:18 237:6 263:17 295:8 325:2 329:10 330:21 331:18 333:1,1,5 333:21 341:19 342:9 355:19 356:7,14 368:17 asking 23:11 40:23 43:15 49:15 50:18 61:8,14 75:4 78:19 83:1 84:15 87:23 88:17 92:17 99:18 101:13 120:15,16 120:18 133:2 134:6,7 141:3 153:21 161:14 187:4 204:17,18 214:17 216:24 220:4 241:1 277:3 281:13 305:18 316:12 335:2 337:21,24 339:22 340:21 341:1,21 342:3 344:14 360:3 361:8 asks 91:9 93:15 aspect 92:15,16 96:6 aspects 72:1 81:3 93:11 301:24 assess 290:6 assessed 46:24
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[assessment - back]

Page 7

assessment 37:17 assessments 183:2 assign 197:7,19 assigning 196:21 assignment 373:2 374:2 375:2 assistant 340:3 associated 124:5 143:13 163:9,19 164:4 176:15 257:16,19 258:2 258:17 296:15 association 5:20 136:3 152:6,13 153:16,17 154:7 154:19,23 192:22 210:6 229:3 associations 155:3 155:4 210:13 assume 90:7 91:8 165:15 176:21 224:7 231:15 361:10 362:17 364:3 assumed 53:10 357:4 assumes 36:9 assuming 91:15 194:17 253:4 323:2,7 325:1 361:19 assumption 192:12,18 222:10 253:7 258:24 assurance 310:11 assure 97:10,12 attached 371:14 374:7 attachments 247:2 attacks 97:17 98:1	attempt 83:15 266:24 267:10 320:14 attempting 320:6 attending 9:5 attorney 9:9 371:12,13 attorneys 58:12 attri 194:2 attributable 180:24 183:5 184:16 192:21 196:21,22,23 197:5 202:6 203:10,13 204:13 310:15 333:24 345:20 347:3 351:8,18 352:6,10 attribute 183:24 184:1,3 191:12,15 191:24 202:20 203:4 346:21 347:20 attributed 185:23 194:3 204:20 313:16 315:10 332:20 333:16 343:10 346:14,16 346:22 360:5,21 362:18 attributes 36:21 277:17 278:24 279:9 attributing 348:4 attribution 191:22 193:1 197:8,20 200:22 308:17 309:6 310:19 337:4 aud 101:2	audio 8:9,10 307:15 august 5:4,22 6:18 11:7 13:9 54:9 210:9 author's 102:24 103:2 authored 368:4 authority 167:7 175:12 341:14,16 authorize 374:11 authorized 9:1 authors 287:23 366:22 367:1 automatically 66:22 availability 107:17 108:3 109:13 121:8 157:14,16 158:14 158:16 173:15,19 173:20,24 234:10 237:20,23 294:21 305:22 319:3,6,14 319:20 328:18,23 329:15,20 331:11 364:24 available 52:10,12 53:8 106:8 107:23 117:4 122:23 124:14 144:17 155:15 157:9,10 157:17,20,23 158:16 170:4,10 170:17 230:20 243:24 254:1 260:11 262:4 264:2 265:3 269:16 293:14 296:3 319:9,17,23 319:24 320:10,11	320:11 323:17 324:9,12,13 325:3 336:14 337:9 345:9 365:15 ave 372:1 avenues 56:17 average 30:23 31:9,12 222:13 325:1 349:21,22 350:10 avoid 76:6 aware 26:19 41:1 52:13 73:4 114:6 115:2 132:21 142:9,10,24 146:8 147:1 161:14,15 166:21 167:9 175:24 176:19 178:6 187:8 196:2 196:7 228:3 231:24 234:19,21 238:9,10,22 274:13,21 276:1 276:10,14 277:6 277:11,14 278:18 279:2,7,12 280:17 281:17,18,19,20 282:1,5,8,9,12,13 282:15,20 283:10 286:24 295:18 323:18,24 324:3,5 327:2,5,13,16 340:18 b b 58:21 59:18 260:4 367:8,12,15 babies 245:15 255:24 back 16:5,6,7,15 23:17,18 24:9 29:13 39:9 42:2
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

45:23,23 48:4 49:13 51:17 52:12 55:2 57:6,12 62:3 72:21 73:16 74:19 83:14 91:17 99:14 126:18 127:15 151:23 155:5 163:3 166:18 170:21 179:2 195:2 201:11,20 213:10 216:2 221:7 235:24 246:9 249:3 253:14 259:22 266:23 271:8,14 271:17 304:13 305:2 307:11,16 315:4,4 335:4,5 337:5 343:17 344:20 351:16 352:1 355:23 359:15 369:11 372:16 background 18:20 77:10 backup 339:4 340:22 bad 119:14 305:14 badgering 333:6 ballpark 173:8 base 82:20 124:12 184:18 358:16 based 19:16 22:18 25:17 26:3,5,6 49:7 55:4 64:9 69:20 81:7 91:8 91:11 92:9 107:5 107:7 108:3 117:3 117:6 118:5 121:21 124:21 128:9,24 134:14	138:11,17,24 140:6 166:8 168:4 179:10 180:15 184:5,16 185:5 187:20 192:21 196:4 197:2 201:2 202:10 206:20 214:24 215:17 217:10 219:22 232:19 240:8 248:14 250:17,24 251:8 254:1 256:4 256:8 259:14 262:12 265:12 281:15 302:9 309:21 311:16 312:6 314:15 318:23 320:15 322:10 327:1 329:3,18 332:20 333:16 336:14 337:8 345:21 346:1 baseline 162:7 bases 92:23 basic 79:2 90:1 162:10 210:24 basically 71:15 90:19 basing 282:22 317:7 basis 17:3 24:19 28:4 45:15,22 55:6 62:5 70:13 82:12 83:16,20 93:19 124:15 140:5 175:3 191:6 202:13 207:9 211:6 212:1 246:4 246:8 252:12 254:16 259:4	265:10 269:10 317:3 321:11 326:9,18 349:24 358:22 359:18 360:16 bear 68:19 bearing 69:10,12 69:21 87:23 307:14 bears 71:9 beat 97:9 began 35:16 199:6 199:9 200:14 219:2 236:21 beginning 9:9 92:12 268:22 269:9 begins 51:15 99:13 151:22 166:17 174:13 221:5 271:13 305:1 307:10 369:9 behalf 9:18,20,22 behaving 161:23 behavior 132:1,9 belief 315:5 354:20 believe 12:21 18:2 30:4 32:5 41:6,9 41:16 47:6 48:2 50:5 61:24 102:7 114:12 116:17 128:22 129:13 135:15,21 136:3 137:11 143:11 146:20 153:14 154:13 164:12,16 164:19,22 168:1 185:2,5 206:13 207:15 216:15 220:5,5 223:1,2	231:15 239:2,14 240:10 241:5 250:17 251:1,3 252:11,13 255:12 262:4,8,18 264:4 266:21 267:9,21 274:24 275:2,7 276:23 279:18 282:17 283:21 285:5 288:16 294:10 302:7,16 305:8 309:18 312:12 318:2 322:16 328:7 345:8,15 361:2 364:13 believing 368:20 belonged 344:23 beneficiaries 286:6 benefit 296:5 benefits 137:17 138:1,7,11,17 146:15 149:1,15 276:3,16 277:8 278:19 283:11,18 284:2 benzodiazepine 189:15 benzodiazepines 189:12,14 bernstein 2:5 9:16 best 90:18 302:5 303:19 better 51:24 83:9 102:9 186:16 212:22 314:12 347:24 beyond 93:4 134:20 135:11 137:22 144:19
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[beyond - call]

Page 9

147:18 189:8 278:12 283:5 biased 332:9 bigger 248:7 318:18 billed 16:10 billing 16:7,11 bit 29:13 64:3 65:18 67:5 101:20 108:19 149:8 157:7 182:8 210:23 248:12 261:6 306:10 314:11 326:22 345:24 361:15,23 blanket 27:4,15 28:2 45:13,20 69:16 111:4 114:20 115:3 116:19 118:2,16 119:21 120:6,7 127:20 138:21 196:3 358:18 359:2,5 board 117:16 248:19 296:11,18 309:2 311:4 body 47:18,19 148:10 184:23 185:4,11,14 186:9 bohnert 153:13 154:11,14 bonus 18:16 bootleg 158:20 bother 161:16 bottle 110:16 bottom 32:15 49:20 139:12 198:19 200:13 205:4 211:18 241:18 268:19	273:19 279:21 285:13 bound 217:16 box 10:18,19,24 11:3 339:20 break 39:11 65:15 99:1,6 161:21 220:22 271:7 304:12 briefly 58:20 61:20 64:22 302:20 303:11 304:12 307:3 341:4 bringing 167:6 britt 2:4 9:15 broad 56:6 82:22 broader 46:12 108:6,19 brought 54:16 brush 98:17 bucket 336:11 344:23 345:24 build 78:3 79:2 building 338:1 burden 63:16 68:19,19 73:15 252:16 269:4 burling 3:5 9:12 60:10 buy 19:12 bye 98:23,23	89:14 93:13 95:21 112:14 113:2 116:8,13 125:14 125:17,22 126:4,7 128:8 131:24 132:2,6,17,23 140:17 142:17 144:9 166:23 167:7,16 168:9,14 168:17,21 170:5 170:24 171:24 172:20 173:13 178:7 179:2,8,24 180:12,20,24 182:9 183:6 186:12 187:10 208:6,8 209:7 211:8 236:6 239:8 239:12 241:20,24 242:2,7,15 243:1 243:14 244:12 245:8 246:1,5,14 246:18 248:16,24 249:13,19 250:3 250:15,21,22,24 251:6,11,17 252:9 259:7,13 260:2 261:4 262:7 263:10 264:1,13 264:15 271:22 282:10 294:4,14 295:7 297:23 299:11,15 300:9 300:15 311:20 312:21 324:7 359:22,24 360:1 360:17,17 366:23 cabinet 110:16,18 110:22 294:12 cabinets 295:3	cabraser 2:5 9:16 10:12 58:12 calc 348:2 calculate 313:23 332:4 348:5 350:11 353:19 calculated 316:19 316:21 351:6 352:19,22 360:15 calculating 312:20 347:2 349:20 360:4 calculation 63:15 63:16 310:14 315:15 326:19 327:6 329:2,8,24 330:1 331:21,22 331:23 333:23 334:3 335:10 337:16 341:21 342:18 344:17 346:2,16 347:20 347:24 348:20 349:1 350:23 353:14 354:9,13 354:17 355:2 357:18 359:9,15 359:19 360:6 361:3,8 365:8 calculations 337:7 337:11 338:3 340:2,4,8,23 341:9 342:15 352:2 355:7,19 362:3 366:5,8 call 51:23 52:4 56:19 80:18,22 88:14,15 90:18,22 91:3 95:15,15 98:10,15,24 161:21 346:9,13
	c		
	c 8:1 58:21 59:18 105:6 118:23 ca 372:24 cabell 1:11 8:15 20:9,14,18,20,22 21:5,7 67:15 69:13 71:9 72:7 72:12 82:18 89:11		

[call - change]

Page 10

362:1 called 10:4 156:17 223:4 calling 52:15 calls 57:6 camel 88:2 campbell 2:19 9:17,17 cancer 198:6,7 291:1,1 cannabis 257:6,10 258:15 capita 157:22 158:2 capitol 2:9 caption 371:6 capture 331:8,24 captures 36:15 capturing 38:4 330:9 331:23 car 80:2 cardinal 2:11 9:20 62:19 305:7 care 41:24 88:18 94:24 143:22 146:4,10 147:20 148:22 149:2,10 careful 303:4 carefully 41:11 209:4 carey 2:15 carfentanil 320:3 324:20 325:3,5,9 325:12 carl 2:12 9:19 301:18 304:11 305:7 carryover 205:10 242:10 case 15:15 16:11 23:21 28:4,4 36:1	44:8 45:15,15,22 45:22 46:17 53:9 53:11 55:9 59:3,5 60:20 66:17,22 67:8 69:1,5,5,6,15 69:20 75:1,6,7,8 84:23,24 88:24 89:5,8,14 90:4 91:12 93:17 98:9 98:15 111:11 130:11 151:7 152:15 181:24 195:24 196:10 204:3,11 300:22 300:24 364:19 372:6 cases 37:16 69:2,9 117:4 130:12 158:7,8 304:4 310:7 casper 218:17 221:11 catalogs 276:24 catch 83:6 categories 338:4 categorized 337:8 361:24 categorizing 336:23 category 347:22 353:18 361:11,14 363:10,20,22 caught 83:7 causal 105:8 155:4 159:5 205:11 241:8,10 358:13 358:21,23 causation 193:14 195:15 241:1 cause 72:1,3,6 152:18 154:20,24	159:7 182:21 189:1,2,5,16,20,22 190:6,7,9,10,10,14 190:21 191:1,20 191:23 193:8,19 193:21 194:12,18 194:20,23 195:3 198:11,12,13,15 203:24 232:24 233:1,3 234:18 241:8 322:21 323:22 358:12 caused 131:4 132:9 152:16 191:21 294:4 332:18 causes 166:7 182:14,19 186:1 186:19 187:15,21 188:3,6,19,20 189:8 190:12,17 190:18,20 191:4 191:12 193:6,23 196:16,18 197:12 233:16 234:14 240:18 249:8 252:4 288:14 290:6 358:11 causing 323:3 365:19 caveat 265:3 ccr 371:20 cdc 5:5 126:12 134:24 135:6 136:8 144:1 184:20 243:22 260:19 262:24 337:9 cell 8:7 51:19 56:19	cellular 8:6 census 259:11,18 259:21 center 3:5 250:1 certain 27:14 36:16,17 45:17 54:9 67:6 70:12 79:7 87:10 140:24 175:19 190:19 296:19 309:14,16 353:24 certainly 54:12 56:23 59:16,22 65:11,14 68:22 74:1 97:13 147:17 160:20 193:3 195:11 196:13 238:16 248:13 249:10 250:1,7 251:24 252:2 286:22 306:18 309:2 359:7 certificate 184:14 187:14 191:10 203:20,23 335:23 345:11 374:11 certificates 184:6 184:10,19,22 191:9 202:13 certification 373:1 374:1 certify 371:5,8,11 chain 131:19 195:15,18 chains 19:22 20:2 challenge 98:2 challenging 96:6 chance 28:16,18 28:21,22 change 69:20 71:24 91:11 92:3
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[change - column]

Page 11

107:3 238:6 268:11,12 321:23 322:2,4,7,9,22,23 324:11 330:5 331:9,16,24 332:1 332:2 372:14,15 374:8 375:3 changed 60:5 267:7 330:1 331:14 changes 14:13 62:14 146:3,6,10 146:12 147:2,20 148:2 229:1 319:3 319:5 321:20 323:3,11 328:23 329:15,20,22,23 330:1,8,12 331:11 332:8,16,24 333:12,18 372:13 373:7 374:7,9 chapter 371:15 characteristic 36:16 characterize 124:16 203:1 255:15,18 262:8 262:11 characterized 144:17 charge 15:16 charleston 2:9,17 chart 24:20 25:1,3 25:7 32:7 34:12 203:12 chase 2:16 cheaper 239:19 check 136:1 259:19 267:6 304:18 327:22	checked 259:21 chemicals 175:19 cherry 96:8 children 259:12 267:3 choice 305:12,15 choking 88:2 choose 94:21 334:16 336:22 christina 2:8 9:21 chronic 5:5,7,11 5:13 21:21 22:5 26:9,11,14,16,16 26:21 29:17,21,24 30:3,13,16 33:15 38:10 43:4 46:2 47:1,4,10,22 48:13 48:21 81:6,14 103:14,18 135:1,7 146:17 291:1 chronically 30:14 cibulka 2:4 9:15 cicero 5:17 6:5 209:18 218:2,4,12 218:17 221:10 circle 29:13 39:9 126:18 circumstance 155:2 186:17 189:17 190:9 200:5 335:18 345:1 circumstances 70:24 154:22,23 185:9 199:4 201:4 310:1 citation 231:1 326:13,15 citations 317:9 cite 12:3 22:10,10 24:18 25:7 27:11	154:1 206:14 208:16 209:9 211:24 215:3 262:20 264:4,17 286:16 287:6 317:3 322:6 327:7 cited 40:18 41:4 41:12 49:24 61:1 64:19 123:23 126:17 135:16,24 144:7 154:16 167:19 169:20 216:23 246:19 262:5 cites 64:11 citing 50:8 city 1:4 3:5 8:14 242:3 299:11,15 372:6 373:3 374:3 civil 1:6,13,20 8:18 65:2 373:5 374:5 claims 41:7 clarification 67:20 101:21 183:9 clarified 330:18 clarify 21:1 169:13 classified 335:11 clause 122:7 clear 46:8 67:17 75:22 90:5 97:1,1 98:12 112:7 113:11,13 115:16 140:23 209:8 230:15 303:20 310:13 321:16 347:9 350:9 clearer 97:6 clearly 125:17	cleveland 372:2 clinic 141:21 142:4,7 clinical 138:24 clinics 142:5,10,16 142:21 closely 38:3 closer 306:11 coaching 277:24 cocaine 254:19 257:7,16 258:3,15 258:17 code 343:20 371:16 coded 315:7 334:7 338:4,5 342:20,21 343:12 344:1,2,9 344:10 345:4,4,11 347:11 351:7 codes 185:5 187:20,21 334:22 361:22 coding 336:17 cognizant 74:14 74:15 75:16 coincides 235:5 collate 28:23 colleague 9:13 colleagues 301:7 369:3 collect 265:13 collected 206:9 college 123:23 267:1,3 columbia 297:18 column 42:23 137:1 155:13 163:5,12,15 164:24 218:24 336:1,3 338:19,21 339:13 340:11
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[column - confirm]

Page 12

362:2 364:5 columns 336:3,24 337:1 339:10 341:2 combination 189:13 335:20 combined 342:21 348:7 come 24:9 62:20 65:11 71:8 73:20 116:6 167:15,19 223:12 242:14 243:12 244:10 271:8 304:13 314:18 322:5 340:12 348:3,20 comes 63:1 145:24 146:1 158:16 166:22 172:1,6 206:3 coming 90:10 172:3 245:24 306:10 343:11 comment 72:9 commission 1:11 8:15 291:16 371:17 373:19 374:25 375:25 commissioned 371:5 commitment 56:6 common 18:20 80:5 114:14,16 123:22 189:12 242:11,16,22,24 243:9 commonly 321:4,5 321:9 communication 150:18	communities 78:17 156:14,15 297:19,20 community 77:13 86:18,18 104:16 105:14,18 106:1 107:23 108:11,21 108:24 109:17,20 109:23 110:10 112:2 114:3,10 115:18 116:5 125:14,17,22 126:5 127:16 128:8 131:21 132:7,13,17,23 133:3,14,18 144:10 147:9,15 157:17 166:8 167:16 168:18,22 169:1 170:5,11,24 171:4,6 172:6 173:16 177:10,16 177:18 178:5 179:3 180:12 186:12 200:2 211:8 222:8 224:6 241:24 246:18 247:8,24 248:1,3 248:16,21 249:9 250:3,8 252:19,21 252:23 253:6,11 253:11 293:23 295:1 298:5,23 367:24 comorbidity 256:16,21 companies 44:16 274:3,7,12,16 275:3,3,10 280:19 281:6 284:8 295:21	company 175:8 comparable 77:11 77:12 comparative 6:12 288:3 compare 54:9 236:10 compared 55:11 69:5 181:17,17 202:17 239:9 250:15 284:18 314:13 325:13 comparing 327:10 comparison 235:6 286:21 314:1,9 327:6 332:6 complain 342:1 362:12 complained 362:8 complete 93:8 302:17 completed 372:16 completely 161:23 305:17 complex 168:20 comply 302:5 303:19 comports 149:3 composition 165:13 compound 331:18 compton 5:19 224:15,20,20 225:4 228:7 229:17 230:20,22 231:3 305:21 307:18,19 compton's 306:15 306:15 computer 209:1	concept 31:18 147:1,6 308:19 338:21 concepts 44:8 concern 69:12 concerned 79:5 80:9 303:9 concerning 69:3 concerns 66:15 69:23 conclude 124:19 205:11 229:19 306:6 307:24 308:8 353:12 concludes 369:24 concluding 259:4 conclusion 82:19 92:23 123:11 211:16 225:19 226:10 228:12 229:9,17 230:8 231:10,12 232:4 246:5 366:5 conclusions 221:21 225:3,11 308:9 358:16 concrete 206:16 311:13 concurrent 235:4 concurrently 273:4,7 conditions 26:13 27:14 142:14 conducted 8:20 40:13 conferencing 8:21 confidential 14:20 confine 334:13 confirm 49:23 50:3 327:22 366:14
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[conflate - correct]

Page 13

conflate 46:14 confounders 196:24 confused 338:23 344:5 confusion 210:3 connection 28:24 320:5 358:7,13 connolly 2:12 9:20 consensus 314:18 conservative 192:5,20 201:4,7 201:10 308:20,24 309:4,8,15,24 310:6,10,17,21 311:2,4,7,14,23 312:9 324:6 conservatively 320:14 consider 92:15,16 141:24 160:1 163:24 190:7 308:11 311:1 312:8,20 318:22 341:15 consideration 66:6 considered 12:9 12:11,16,18,22 156:16 208:24 209:5 249:16 267:3 318:24 325:6 329:7 345:20 346:7 347:7 349:22 367:14 considering 336:4 consistent 198:4 229:2 259:19 359:7,13 consistently 161:24 206:22	consists 171:2 constrained 311:14 consult 17:2 consultant 297:16 consulting 10:23 consume 106:9,11 106:14 consumed 180:6 contact 52:14 contain 241:7 contained 314:21 317:16 contd 3:1 6:1 7:1 contemplated 162:1 content 341:19 contents 23:11 context 54:19 58:21 65:4 73:20 130:8 156:12 165:11 292:3 308:23 309:2 continue 8:10 55:6 90:15 302:7 322:13 341:8,20 342:3 351:7 353:19 362:16 continued 51:13 88:12 99:12 151:20 166:15 221:4 271:12 304:24 307:8 321:23 322:2,4,7,8 369:8 continues 109:12 321:17 322:19 continuing 263:8 contrast 363:14 contrasted 167:17 203:5	contribute 185:17 195:6 196:19 234:1 249:8 251:16,20 287:14 295:24 contributed 72:6 134:5 249:19 288:9 292:15,21 294:13 295:6,12 295:13 296:6,20 315:7 320:12 contributes 249:22 294:9,24 contributing 185:1,3,6,22 186:1 186:19 187:21 188:3,6,19 189:1 191:4,12 233:16 234:14 252:4 274:23 288:21 290:17 291:6,20 293:9,18 361:17 362:4 363:10 contribution 323:7 contributor 237:15 contributors 250:10 contributory 197:12 control 45:6,17 196:18 197:1 controlled 18:23 299:23 controverted 291:17,23 292:2 conversation 144:4 367:22 368:1	conversations 8:6 conveyed 283:11 copied 73:7 76:10 76:21 copy 212:18 corners 158:12 corollary 53:5 corp 373:3 374:3 corporation 1:8 1:14 3:2 8:16 372:6 correct 11:17 12:3 14:10 15:21 20:23 21:16 22:11 24:20 24:21,23 25:4,14 25:18 26:18 29:9 29:24 30:1 31:8 31:19,23 32:8 33:12 34:2,14,21 35:12,13 36:23 37:2,5,7,14,23 38:6,22 39:1 47:23 50:5,9,14 51:5,6 77:24 82:21 83:21 98:6 103:8 105:2 111:3 115:20 119:19 122:14,19 128:2 130:24 132:10 133:20 138:3,8 139:22 143:20 159:22 169:4 170:24 171:1 172:3,7,8 173:22 186:21 187:18 190:12,19 195:5 195:22 196:2 198:3,17 200:4,19 200:20 208:7 230:7,21 231:18 233:14,15 235:15
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[correct - data]

Page 14

242:4 243:14 244:21 245:10,19 249:6 263:11 269:15 272:7,10 274:20 275:11,20 283:9 287:9,10 292:10 293:23 310:2,17 312:22 313:4,5,15,23,24 314:16 315:16 316:22 317:1,4,17 317:24 318:15,21 322:19 323:5 325:17 326:6,15 326:23 327:4,5,14 327:17,20 328:1 331:21 332:13 335:13,14,20 336:18 337:9,14 344:12 348:3,24 349:3,4,12,13 350:4,21 351:9 353:8 356:24 357:5 359:17,21 359:24 361:21 366:6 corrected 15:1 183:14,16 244:4,8 correction 321:13 336:9 354:5,6 corrections 15:3 201:12 372:13 374:17 correctly 350:7 371:9 correlate 164:8 295:20 correlated 237:20 corroborated 25:5 cosmic 131:23	cost 239:14,18 costs 239:15 counsel 8:14 9:4 9:11 14:20 22:16 29:10 33:20 39:6 50:16 52:10 58:7 58:15 60:4,9 61:6 67:19 69:3 70:3 78:19 81:15 86:6 161:6,12 215:20 362:8,20 371:12 371:13 counselor 24:12 43:10,20 49:2 216:9 count 51:4 242:6 counted 245:1 counterfeit 133:13 174:3 180:24 181:4 203:17 204:1,5,6,14 323:20,24 324:9 counterfeits 204:22 counties 21:12 counting 52:22 261:14 country 149:6 228:9 289:1 county 1:11 8:15 20:9,18,20,22 67:16 71:9 82:18 183:7 236:6 242:3 244:12 245:9 246:6,14 250:15 250:21,24 251:6 251:11,17 259:7 259:13 260:2,18 261:4 262:7 263:10 264:2,6,15 271:22 299:11,15	311:20 312:21 360:17 366:16 371:2,4 373:10 374:15 couple 29:11 62:20 119:1 279:14 course 82:2 123:7 148:8 355:3,6 court 1:1 8:17,23 9:24 22:20 57:22 58:22 65:8 66:16 67:9 68:13 77:3 97:16 302:22 306:23 373:7 courtesy 57:11 cover 60:18 304:7 covered 23:19 24:4,5 31:13 273:9,15 303:1 covers 318:13 covid 305:16 covington 3:5 9:12 60:5,10 create 110:10 155:16 160:15 172:14 232:15 created 114:6 158:3 177:15 creates 157:4 234:10,11 creating 233:21 creation 292:8 342:19 criminal 294:5 crisis 6:15 39:15 40:2 133:22 134:5 236:21,23 248:2 294:4 295:6 criteria 26:10,17 29:22 30:9,13,15	34:23 107:6 243:7 criticisms 368:3,7 cross 206:20 207:5 207:7 crr 371:20 ct2 6:17 13:7 cud 101:2 cumulative 22:23 59:2 61:7,13 65:6 65:16 89:4 current 126:3 129:2 226:1 304:14 currently 304:16 customers 19:20 300:14 cut 65:21 87:12 cutting 269:6
d			
d 8:1 60:2,2 dan 277:22 278:3 dangerous 325:6 332:16 333:13,14 data 5:14 21:22 22:6 41:7 70:1 104:17 110:12 116:9 119:2,6,8 140:19 143:15 167:18 170:19 180:16 184:18 186:11 192:6 199:9,11,14,15 201:6 202:9,10 206:10 207:19,20 208:13 214:24 220:1 227:6 228:3 228:5 229:5,15,18 229:20,21 235:19 238:9 243:22,24 245:3 250:13 252:13 253:4			

[data - decreased]

Page 15

254:1 258:21 259:11,18,21 260:11,17,18 262:4,18 264:1,2 264:16,21 265:12 265:13 267:22 268:20 269:11,12 269:13,16,18,20 269:22,24 276:22 279:24 280:14 305:23 306:4 307:23 308:1,5,8 316:4 317:16 318:23 319:12,16 319:20 325:10 327:8,22 328:10 337:9 338:1 360:1 360:16,17,23,23 363:9,12,14,19 364:7,22 database 275:24 276:23 date 17:10,21 18:6 18:7 126:1 129:2 230:14 372:9 373:3,9,19 374:3 374:13,25 375:20 375:25 dated 5:4,8,12,15 5:17,19,22 6:5,9 6:11,13,16,21 7:4 11:7 21:23 39:17 42:8 48:15 100:14 103:21 209:18 210:9 218:13 224:15 230:6,15 288:5 289:9 325:21 dates 230:12 davies 246:19,24	day 1:21 58:14 301:16 302:6 371:17 373:16 374:22 375:22 days 341:17 372:19 dc 2:13 3:6 de 139:9 dea 149:21 150:1,6 150:10,12,15,19 295:4 dead 97:9 deadly 176:6 deal 20:2 23:24 dealer 133:8 168:1 169:9,15,17,24 173:7 175:11 195:13 196:1 dealers 179:18 237:5 239:12 dealing 129:18 201:16,17 264:9 264:11 275:5 dealt 63:4,22 230:23 dear 372:10 death 181:16 182:1,14,20,22 183:23 184:6,9,14 184:19,22,23 185:2,3,6,10,13,17 185:23 186:5,20 187:3,14,15,23 188:2,4,10,21 189:3,7,9,16,20,22 190:6,7 191:8,10 191:12,15,20,21 191:23 193:6,9,11 193:19,21,24 194:13,21 195:7 195:16 197:5	201:18 202:12,15 203:20,22 204:1 204:12 241:8 287:12 313:11,11 314:2,6 319:19 320:21,22,24 323:9,23 324:18 329:6 332:2,3 334:7 335:22 343:13,20 344:1 345:3,11,13,14,16 345:19,19 346:9 346:10,10,13,14 357:2 359:18 360:1 361:18 deaths 6:10 152:7 152:11,17,19 153:3,8,9,18 154:8 182:9 184:1 192:1 194:2,5,7 195:4 196:19 197:12 200:23 201:21 202:1,5,20 203:3 203:12,16 204:19 229:5 236:7,16 237:16,21 238:1 240:18,20 241:3 241:13 287:15 288:14 309:6 310:14 313:16 314:16 315:6,10 320:15 322:11 324:17 325:21 326:20,21,22 327:3,21 328:5,16 329:3 331:3 332:18,20 333:16 333:23 335:22 336:1,12 337:8,12 338:3 342:20,21 343:8,10,12	345:17,18,22 346:1,6,7 347:3,7 347:8,13,14 348:6 348:13 349:9,11 349:12,21 350:4 350:14 351:7,18 351:21 352:4,8,9 352:13,14,15,20 353:1,2,3,5,6,11 353:13,17,22 354:7,11,12 356:16,18,20 360:21,24 361:4 361:11,16,20 362:3,18 363:10 363:20,21 364:5 364:20,21 365:10 365:19 dec 6:13 288:5 deceptive 44:15 decide 25:22 116:16 121:19 124:20 130:5,20 137:16 190:23 345:3 decided 366:1 decides 130:16 deciding 187:16 344:22 decisions 129:5 138:1 decline 232:11,12 235:4,13,20 262:1 264:18 268:23 269:9 270:13 declined 235:2 264:15 declining 265:5,11 decreased 270:2 365:2,3,5
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[deed - dial]

Page 16

deed 373:14 374:20	256:1,11,18	224:12,17 247:1	160:13 172:10
deemed 372:20	dependent 20:13	271:14 288:2,7	312:18 332:11,13
deep 305:11	242:12 243:10	289:5,11 302:17	339:2 354:21
default 343:19,24	337:12	305:2 307:11	description 54:11
345:2	depending 18:16	325:19,23 341:12	103:2
defend 72:5	33:7 194:11 269:1	341:13 363:1	descriptions 284:1
defendant 2:11,18	334:8	369:10 370:5	descriptive 6:4
3:2 8:14 9:11 10:4	depends 106:21	371:5,9,13 372:9	209:16 339:13
59:7 95:11	141:8 196:12	372:12 373:1,3	design 46:23
defendants 1:9,15	309:1 310:3	374:1,3	297:16,21
1:19 18:22 58:15	deponent 53:16	depositions 22:19	designed 40:12
72:2 90:21 300:21	301:8 329:12	23:2 43:22 58:21	designing 297:14
355:18	369:15,21 370:6	65:17 83:17 84:6	desire 62:22 149:5
defense 69:3 70:3	depose 59:14	89:4 91:22 103:1	detail 124:9
defined 139:20	deposed 59:5	149:20 162:14,22	208:22
defines 139:24	deposition 1:19	215:23 303:3,22	detailed 282:17
definition 30:5,7	8:9,13,20 10:9,10	303:24 304:3	details 96:8
34:6,9 106:21,22	11:5,9 13:6,11,14	depression 163:8	determinant
107:1,4 108:13,15	15:11 17:2 21:19	163:19 164:4,20	233:21
108:20 112:11	22:1,18 24:8,12	deprivation 165:1	determination
190:14 272:13	34:4 39:13,19	deputy 225:6	83:11 165:2
273:11 314:18	42:4,11 43:9	derived 139:9,9	determinative
degrees 91:6	48:10,17 49:3	describe 27:23	357:24
delivered 111:8	50:17 51:1,16	104:24 105:17	determine 182:19
delivers 112:10	53:14 55:4,6	153:23 167:3	determines 22:22
demonstrates	58:17 59:11 63:3	175:16 277:8,17	58:24
152:5 154:6	63:6,9,18,19 64:8	278:19,24 279:8	determining
denominator	64:9,17 65:12	312:24 332:23	182:14,21
352:3	66:3 67:24 73:5	334:22 347:19	detox 243:8
density 155:15	73:13,22 76:9	362:4 368:15	develop 20:21
157:9,10,20,21	81:5,20 82:3	described 123:15	46:4 61:3 183:4
158:3,11	85:15 86:2 90:8,9	162:13 290:9,14	249:23
department 148:9	90:14 93:22 97:3	334:4,18 343:18	developed 284:11
247:9 366:24	99:14,18 100:9,16	344:10 347:1	development 6:3
372:22	101:7 103:17,23	348:15 349:6	209:15 218:6
depend 138:20	134:23 135:3	350:12,15 353:10	221:12
139:7 155:2 176:8	151:23 161:9	366:3	diagnoses 107:5
195:16 235:22	162:18 166:18	describes 288:12	diagnosis 107:6,9
dependence 5:10	178:20 209:13,20	288:13	diagram 35:3
48:12,21 255:7	210:5,11 218:10	describing 108:10	dial 51:23
	218:15 221:6	110:11 156:12	

<p>die 198:8</p> <p>died 189:14 324:4 335:19</p> <p>differ 67:7 72:12 100:24 205:24</p> <p>difference 67:15 83:21 86:12 89:21 93:16 129:15 141:6 301:20,20 303:17 350:23 357:17</p> <p>differences 6:20 42:6,16 81:2,17 328:17,23 329:15 329:20</p> <p>different 15:10 16:13 19:22,22 33:7,11,11,12 46:16 49:24 54:11 59:13 60:6 63:16 64:14 69:4,14 70:9,10 73:14 75:9 76:14 77:2,5 77:13,19,23 79:8 79:23 81:10 92:19 119:2 141:9 154:20,24 175:20 178:22 180:8 186:15 191:17 203:11 205:18 215:23 222:14 227:18 243:6 250:15 270:15,16 270:18,21 271:1 277:3 295:21 319:23 324:24 338:4,13 342:9 348:18 354:4 355:4,11 357:16 365:13 366:7</p>	<p>differentiate 73:18 273:5</p> <p>differing 50:12</p> <p>differs 67:2,3</p> <p>difficult 74:2 76:12 181:8 362:5 362:15</p> <p>difficulties 28:23</p> <p>difficulty 223:14</p> <p>digest 98:6</p> <p>diligence 300:12 355:3</p> <p>direct 197:7,19 240:12 241:8 279:24 280:4,6,8,9 280:14,21,24 281:2,4,7 282:5,9 308:17 314:1,6,9 318:14 337:4</p> <p>directed 34:1</p> <p>direction 66:15</p> <p>directions 37:13</p> <p>directly 55:21 183:5 184:1 185:22 191:13,15 196:22 230:2 241:7 275:19 278:23 309:7 310:15 320:19,19 322:21 333:24 345:20</p> <p>director 225:6</p> <p>dis 298:3</p> <p>disagree 44:2,2 50:24 149:9 219:11 358:20</p> <p>disagreement 58:16</p> <p>disagrees 70:9 91:16</p>	<p>disbelieve 220:6</p> <p>disclosed 335:1 337:6 340:22 354:18</p> <p>discover 14:16,23</p> <p>discovered 14:14</p> <p>discovery 22:21 22:22 58:23 59:1 62:7 65:6 66:16 66:18 67:10 74:7 74:13,21 75:18,23 76:5 88:12 90:14 90:15</p> <p>discrimination 165:4,5</p> <p>discuss 97:19 111:12,16 157:7 230:8 284:16</p> <p>discussed 67:23 127:13 194:10 237:4 263:1,14 264:8 360:11</p> <p>discussing 66:8 196:17 197:11 275:4 280:20 292:9,11 354:21</p> <p>discussion 24:2 51:12 54:24 57:7 91:8 93:7 94:3 151:19 162:2 221:21 281:16 307:7</p> <p>discussions 14:20 94:5 247:12 298:4 298:8 299:1</p> <p>disingenuous 93:21</p> <p>disorder 6:8 7:3 26:1 34:10,13,24 35:4,16,19 36:22 37:1,4,12,22 38:1</p>	<p>38:5,9,24 46:5,8 46:24 85:13 94:6 94:8 100:7,13 105:10 106:15,16 106:18,22 107:1,4 126:22 159:18 160:7,19 180:23 181:7,12 201:17 201:19 204:4 227:1,14 230:3 232:16 234:17 236:21,24 243:11 244:11,19,24 245:10,19 249:24 250:23 253:16,24 254:4,5,9,23 255:5 255:19 256:4,8 257:2,13,15,19 258:1,15,15 267:20 271:23 280:1,10,15 289:6 289:21 290:8,18 291:6,13,21 292:16,23 293:10 293:19</p> <p>disorders 255:3,11 255:22 256:17 258:14,17</p> <p>dispense 19:16</p> <p>dispensed 104:7 106:7 108:4 121:9 121:14,23 122:1,4 122:5 130:1,9 252:19 253:5</p> <p>dispensing 124:4</p> <p>dispute 168:18</p> <p>disseminated 132:12,17 284:3</p> <p>distinct 61:16</p> <p>distinction 204:15</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

distinguish 36:19 202:9,14	150:21 151:2 176:22 274:20,21	119:5,14,18 123:5 130:16,19 131:11	142:24 143:5,11 143:17 157:11,14
distinguishing 46:10	275:22 276:2,4,9 278:23 279:2,8,14	132:9 133:4 143:9 152:2 163:3	263:8,14 275:11 275:19,23 276:2
distribute 19:3,7 167:8	279:17,19 282:6 282:10,14,16,19	166:21 171:15 180:1 203:6	276:11,16 277:7 277:16 278:19,23
distributed 20:19 21:11 89:10 131:18 150:9 170:11,14,14,16 170:18 171:3,5 172:19,19,22 176:20 177:5,19 177:21,24 178:1,4 202:16,17 252:21 294:20	283:3 300:14,21 300:24 district 1:1,1 8:17 8:18 disturb 58:14 disuse 36:22 diversion 105:1 108:10,14,15 111:2,6,12,12,16 112:8,11,20,23 113:14 114:13,14 115:14 125:4 133:7 151:3 152:19	204:24 209:1 210:17 216:14 218:19 221:9 223:17 231:24 238:15 271:17 273:12 279:15 286:13 289:20,24 292:18 294:3 297:2 299:10 300:17,19 301:7 301:24 302:13,14 303:13 305:6,21 307:14 340:1 342:14 367:21 368:2 369:12,20	279:8 280:10 283:12 284:2 293:22 294:2 296:13 document 22:3,8 22:11 25:12,12 40:5 42:20 48:23 67:22 100:21 103:24 218:23 225:2 339:18,23
distributes 176:24	divert 124:14	doctor's 35:20 37:4,13,23 38:1,18 41:23,24 106:19 116:23 117:3 138:10 154:9 272:14,17	documented 32:17 153:5 295:22
distributing 139:17 177:11	diverted 108:8 109:1,3 113:22 131:19	doctors 19:17 38:13 115:19 116:16 117:7,9,18 117:22 118:15,17 119:12 120:4,10 120:16,19,21 127:17,22,23 128:1,4,9,11,14,15 128:16,20 129:3 130:5 131:4,15 132:19 133:23 134:4,9,13,17 137:10,16,21 138:7,16,22	documents 28:14 55:5 61:1,9 62:4 144:3 145:16 300:13 301:1
distribution 20:18 21:4,6,7,9,15 120:23 121:1 125:16 132:5,11 142:19 150:16,22 155:18 167:17 168:8,13 171:11 172:6 173:12 179:21 235:18 292:7 299:22	divide 155:11		doing 29:5 53:2,3 56:21 122:16 162:10 178:20 179:17,17 191:4 278:13 280:8 310:8 335:10 341:6 349:22 350:15,19
distributor 112:9	doctor 10:8 11:13 14:4,6,13,22 15:7 16:17 17:9 18:19 22:7 23:9,20 24:18 28:11 29:3 29:6,15 34:2 36:8 39:22 40:4 42:12 42:15 43:15 44:12 45:24 48:23 49:8 49:16,19 51:8 53:7 60:10 61:11 93:23 99:17 100:17 101:15 103:24 115:6 116:22 117:5 118:8,9,10,11		don 2:3 9:14 16:15 53:5,17 58:11 79:20 84:13 99:6 101:10 278:3,5,5 281:20 341:18 363:5 372:5
distributor's 112:21			dormitories 267:1
distributors 18:23 19:7,11,20,23 20:13,19 21:14 44:16 111:8 113:15 114:17,22 115:1,4 120:2,10 120:18,20 130:20 130:23 138:8,13 138:14 150:10,15			dose 31:22 32:11 32:18,23 33:2,3,7 33:9 94:7 130:6 130:15,21 176:8

262:1 doses 33:12 121:10 129:23 130:2,10 dosing 31:18,19,21 32:2,6,8 47:21 48:6 double 136:1 246:6,15 304:17 doubled 353:17 douglas 2:15 dowell 6:10 317:11 318:3,5 325:21 326:1 328:9 dr 6:17 13:7 draft 326:11 drawing 173:4 drawn 35:3 308:10 drill 125:19 driven 279:23 driver 251:23 drivers 231:6 249:5 driving 109:10 137:24 drop 268:8 dropped 228:1 268:4 drug 1:7,14 6:10 8:16 19:12 133:8 156:3 159:15 160:19,22 163:18 164:3,19 166:2,23 167:2,10,16,24 168:12,15,17 169:2,9,15,17,24 170:6 172:23 173:6 174:24 175:8,11 176:20	176:23 179:17,18 185:18 186:13 192:7 195:13,24 196:4,13 209:6 214:14,19 221:24 222:2 225:7 230:1 237:5 239:11,16 240:21 248:11 254:20 257:12 262:19,22 277:9 277:17 283:12 294:5,8 314:2 315:23 316:2 320:23 323:9 325:20 332:2 372:6 373:3 374:3 drugs 171:5 185:10,13,24 186:9 193:11 222:13,14 253:17 253:21 257:3,5,7 257:21 258:3 276:3,17 278:20 278:24 328:19 329:1 366:16 dsm 107:3,7 due 71:3 86:6 108:2 153:3 189:7 203:4,5 227:12 236:7,16 248:11 291:10 294:23 302:21 314:23 321:13 336:12 343:9 352:17 355:3 356:17,18 duly 10:5 371:4,6 371:7 duplication 73:6 76:6 duplicative 22:19 22:23 23:5 24:5	43:20,22 54:19 59:2 61:7,13 65:5 65:6,16 74:8 83:18 90:2 97:2 161:6 duration 29:19 32:19,23 33:2,8,10 33:12 47:10,16 91:6 94:7 176:8 261:19 dynamics 165:11 165:12 e e 8:1,1 10:3,3,3,3 28:15 42:22 60:1 60:2 113:21 155:12 163:5,6,14 340:20 341:13 earlier 54:18 94:20 305:19 323:16 334:4,24 335:7 338:12 366:10 367:10 early 6:8 100:8,13 easier 98:16 easily 118:22 294:12 east 2:16 economic 165:1 195:8 233:14 249:5,12 251:19 edlund 5:11 41:6 41:13,16 48:14,19 49:10,17,21,24 54:11,22 55:15 57:3 60:2 91:3,11 93:23 99:19,21 effect 72:1,4 145:17 146:23 154:20,24 160:12	effective 43:3 44:22 81:6,13 262:23 effectiveness 297:5 efficacy 45:1 144:7 262:21 effort 76:5 232:15 efforts 262:14 eight 81:19 353:7 353:12 eighth 367:16 either 15:11 35:15 54:11 115:2 168:19 255:9 270:23 334:7 electronically 14:1 elements 75:17 79:2 elicit 65:13 eliciting 96:20 ellis 218:17 221:10 email 372:17 embraces 242:2 emerging 220:2 empirical 152:4 154:5 employed 366:23 371:12,14 employee 371:13 ems 247:7 enclosed 372:12 encountering 313:18 315:8 encouraged 295:15 ended 98:24 199:5 201:13,15 endorsement 291:15
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

engage 33:16 106:11 278:18 279:2 297:7 engaged 35:5 36:7 38:6,22 39:1 61:12 145:9 168:8 168:12 193:1 223:22 243:2 265:22 271:24 272:3,8,20,21,23 272:24 274:21 275:6,20 276:2,4 276:17 277:23 286:4 287:7 296:13 297:21 309:5 engages 174:21 england 103:15 enhance 147:8 entered 63:4 374:9 entire 36:1 87:13 128:7 225:23 226:18 270:4 373:5 374:5 entitled 1:20 22:4 40:1 42:15 48:19 55:12 60:21 68:16 68:22 72:3 73:9 75:2 77:19,20 92:21,22 95:6 96:3 210:13 218:1 218:17 221:11 224:20 278:13 289:21 entries 338:17 entry 338:18 367:19 environment 165:3 292:9 294:23	environmental 194:9 epidemic 6:15 39:16 40:3 104:4 129:7 134:8,16 epidemiological 121:22 122:13,21 123:10 126:21 297:8,15 299:24 300:3 epidemiologically 315:20 epidemiologist 59:4 157:2 229:19 306:5,22 307:24 308:5,12 355:10 357:9 epidemiologists 182:17 epidemiology 159:5 246:10 308:23 321:20 355:4 356:9 357:19,22 equal 181:19 314:12 316:17 equals 75:7 era 305:16 errata 6:18 13:8 14:3,9 244:1 271:18 311:1 372:14,19 374:7 374:10,18 375:1 error 268:13 errors 14:24 especially 128:5 157:24 esquire 2:3,4,4,5,8 2:12,14,15,19 3:3 3:4,4,9	essentially 201:9 323:10 establish 82:24 established 335:6 estimate 47:15 168:3,24 170:6 183:4 184:15 192:5,10,19,20 198:20,23 199:8 201:7,15 203:19 211:7 214:10,11 214:24 217:8 242:15 243:13 259:6,7 267:18 308:24 310:5,7,17 310:21 311:2,4,7 311:23 312:8 313:1,10,21 314:3 314:7 315:13 316:1 318:16 320:6,8,20,23 322:22 324:6,12 332:1,19 337:19 349:11 350:2,8 351:1,6,10 352:12 352:16 353:3,7,15 355:8 357:15,20 357:21 359:23 363:15,21 estimated 47:2 192:7 211:14 214:13 245:24 271:23 311:10 336:13 343:7 349:8 352:5,7 360:23 363:19 estimates 122:23 182:8 193:4 201:4 201:18 211:3 213:17 248:14 308:20 309:4,24	331:4,6 340:13 355:21 365:23 estimating 200:22 320:14 333:15 352:2 356:8 366:8 366:15 estimation 324:18 336:16 et 1:8,14 5:11,14 5:17,19,22 6:5,9 6:10,13,16,21 7:4 8:16 21:23 31:4,6 32:4 39:16 42:8 48:14 100:14 209:18 210:9 218:13 224:15 288:5 289:9 325:21 372:7 373:3 374:3 ethical 241:16 ethnographic 207:8 evaluate 125:21 127:7 249:13 279:5 evaluated 125:5 127:2,4 129:8,12 129:20 140:16 142:16,19,21 146:3 148:3,18,22 148:24 149:13,14 150:7,12,18,24 154:14 246:4 251:9 263:5 276:6 279:11 281:8 282:7,11 296:8,22 300:2 evaluates 144:23 evaluating 127:10 183:1 275:23
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

evaluation 126:6 143:21 144:15 149:11 evans 1:21 8:23 371:4,20 event 119:17 190:19 events 68:21 250:9 288:14 everybody 63:5 244:19 evidence 36:10 111:6 112:13 113:1,3,8,17 116:7 116:11,15 120:9 125:15 129:1 132:1,5,8,11 135:10 153:2 219:15 229:2 252:8 262:12 265:3 278:22 306:7 322:1,4 exact 338:8 exactly 30:21 71:16 83:9 87:18 87:19,21 139:23 163:6 176:13 207:4 287:17 292:2 313:24 315:18 345:6 348:15 examination 4:1 10:6 59:10 67:23 80:11 97:2 302:10 305:4 examinations 53:7 61:11 examine 54:2 55:12 examiner 182:11 182:12 185:8,17	186:18,22 187:16 188:17,18,24 190:23 191:4 example 30:11 41:19 78:15 81:21 109:22 110:14,15 110:19,20 115:12 115:15 122:23 123:5,18 135:22 147:12 156:3 167:21,23 171:12 171:15 173:6 187:1 189:12 229:24 236:11,11 237:24 248:9,15 249:1 252:14,15 254:19 256:17 266:8,24 275:17 297:9 311:13,18 320:1 322:24 323:14,15 352:24 357:19 358:11 examples 267:20 excel 339:3 340:11 340:18,22 341:3 exception 71:4,15 84:14 87:20 exceptions 88:8 excess 124:13,22 136:10,17,21 137:11 149:12 293:13 294:23,24 excessive 137:14 170:23 exclude 107:4 excluded 107:9 exclusive 37:17 157:13 338:7,11 343:12 exclusively 111:22 207:22	excuse 18:11 102:4 323:19 excused 99:17 executed 374:10 execution 373:14 374:19 exercise 310:23,23 exercising 116:23 exhibit 5:1,3,5,7,9 5:13,16,18,20 6:1 6:2,6,10,12,14,17 6:19 7:1,2 11:3,5 11:9,14 13:5,6,11 13:12,13,16,23 14:13 15:5 21:17 21:19 22:1,2,15 25:1 28:5 29:3 39:4,7,13,19,24 42:2,4,11,14 45:24 48:8,10,17,18 50:9 99:19,22 100:3,4,9 100:16 103:9,10 103:12,17,23 134:21,23 135:3,6 136:8 155:5,8 163:4 183:17 201:11,14 209:12 209:13,20,22,24 210:1,2,5,11,12 211:24 217:22 218:4,5,10,15,16 221:10 222:21 223:8,13 224:9,12 224:17,19 244:2,8 288:1,2,7 289:3,5 289:11,19 312:12 317:18 325:18,19 325:23 326:2 367:8,12,15 exhibits 13:24 223:12 339:21	340:17 341:11 366:17,18 exist 168:15,21 existing 179:11 180:15 exists 358:22 expanded 107:22 expands 173:12,15 expansion 107:15 108:1 131:2 133:15 296:6 expect 220:8 232:10 expected 216:11 experience 139:1 191:8 221:23 222:2,12 310:8 experienced 199:1 expert 5:3 6:18 11:6 13:8 23:20 44:7 53:19 54:2 58:21 60:11,12,14 60:19 61:14 63:14 64:10,12 72:24,24 73:2,16 74:12 75:24 76:7,17,18 84:1 126:19 246:23 282:22 283:6,8 303:24 expert's 67:2 71:24 88:23 91:22 expertise 19:24 126:22 168:16 182:13,21 183:1 201:2 297:1,4 299:21 300:3,5 309:21 experts 54:18 65:5 75:19 298:4,8 304:3 342:9
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

expiration 373:19 374:25 375:25 expires 371:17 explain 77:5 84:9 89:17 106:24 169:14 248:22,24 306:21 313:14 351:14,17,23 364:15 365:18 explained 290:9 322:16 354:20 356:15 explains 358:23 exploitation 293:2 explore 63:23 70:13 exposed 35:19 exposure 50:12 91:6 105:1,9,13,14 105:18,21 106:6 194:13,15,16,18 194:20,22 195:3 197:15,17 199:17 222:15 252:2,6 exposures 159:6 164:9 expressed 98:2 114:12 expressing 68:2 97:16 extending 162:19 extends 162:18 extensive 94:15 extent 12:10,17 20:19 22:21 24:1 58:23 85:17 94:14 113:9 144:16 147:14 179:15 237:23 254:11 294:18 296:2 300:2 301:9,12	extra 18:16 extraordinary 139:17 141:2 f faber 63:10 faber's 85:7 86:4 face 364:11 facilitated 273:21 facilities 139:14 139:16 140:6,17 141:4,24 facility 140:10 141:7,16,17,19,21 142:1 266:7,15 fact 29:16 62:9,10 62:20,23 64:6,9 68:21 73:21 74:8 74:16,16,17,23 75:16,23 76:5,14 77:3 88:10 91:11 94:2 124:13 146:5 161:8 269:7 316:8 316:20 351:3 factor 145:13 149:11 156:14 160:7,17 190:14 197:14 198:5 231:20 233:5,10 234:6 249:2 288:22 291:5,11 291:19 292:14,21 293:17 314:24 318:16,18 factored 148:14 148:18 factorial 158:22 159:1,3 160:2 161:11,20 194:5,7 262:9,11 factors 6:10 138:2 145:7,20 153:24	159:4,5,9,11,20,22 160:11,13,18 161:10,20 162:12 162:15 163:8,22 164:1,4,16,20 165:7,13,18,21 166:3,9 185:17,22 194:8,9,9,14 195:6 195:8,8,8,11 196:23 197:4,8,10 197:11 232:19 233:9,12 234:1,13 248:21,24 249:5 249:11,16,18 250:5 251:16,19 251:24 252:1 262:10 279:23 287:14 288:8 290:9,14,16 325:20 facts 12:2,6 36:10 74:20 76:6,16 78:9,12 79:4 93:12 factual 235:11 fair 23:16 61:24 62:2 65:19 67:3,8 83:22 84:8,22 97:5 98:4 121:16 121:16 157:1 167:13 171:19 183:21 207:19,21 257:14 269:5,5 302:23 311:17,24 334:9 346:11 347:5 350:16 fairly 140:23,23 faith 82:23 97:14 118:8,12,18 119:14 128:16,21 129:4	fall 94:22 177:10 familiar 22:7 31:18 42:19 146:5 148:1 210:17 235:17 276:8,10 289:24 family 110:15 114:13,18,22 123:22 124:4,14 125:2 133:7 155:17 165:11,12 165:12,13 170:1 far 18:4 86:9 96:18 204:5 225:9 fault 302:14 february 6:21 42:9 federal 1:20 19:2 65:2 feed 301:11,12,13 feedback 28:20 feel 66:5 84:9 223:17 302:20 303:20 311:14 330:13 feeling 147:14 felt 309:8 311:6 312:5 320:17 350:23 fentanyl 70:18 174:14 176:2,6,14 176:15 181:15,24 182:4,5 186:4,18 187:2,4,5,6,10,15 188:1,11,11,14,18 189:1,19,19 190:2 191:11,16,20,24 192:14 193:1,7,9 193:20,22,24 194:8,16,19,23 195:1,4,4,7,14,17
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[fentanyl - follows]

Page 23

195:22 196:1,10 196:19 197:12,18 197:22,24 198:2,9 199:6 200:23 234:23 236:16 237:2,11,16,20,21 237:24 238:1,5,11 238:11,12,14,17 238:18,20,23 239:3,3,5,6,8,13 239:19,21,24 240:4,13,18,20,21 241:2,7,13 254:9 254:13,13,15,18 254:18 313:3,8,15 313:17,18,22 314:4,5,9,10,13 315:5,7,8,14 316:3 316:8 318:14 319:3,4,4,6,9,14 319:17,20,21,22 319:24 320:2,10 320:10,20 323:12 323:16,22 324:2 324:13,16,21,22 328:18,24 329:16 332:17,21 333:13 333:17 335:17,20 335:24 336:5,10 336:12,13,18 343:7 345:1,4,12 345:14 346:10,13 347:5,13,13 348:4 351:19,22 352:13 352:14,21,21 353:2,3,4,6,8,11 354:2,2 356:3,3,19 356:23,24 357:4,5 357:10,12,13,13 360:5,12,22 362:19 363:11	364:16 365:1,5,9 365:15,16,18 fentanyls 325:7,9 field 201:2 309:13 309:21 310:9 312:7 321:4,6,19 332:6,14 fifth 100:22 147:12 291:16 fight 364:10 figure 25:6 32:9 32:11 34:11 35:9 35:10,10 36:5 46:1 47:10,12 48:5 52:2 73:16 76:10 135:18 169:20 197:4 200:19 201:19,21 202:1 203:17 238:6 244:3,4,8,11 245:8 246:11,13 253:15 270:12 271:18,21 306:12 307:2 310:24 313:9 328:12 335:10,11 337:1 338:22 339:7,7 342:16,24 343:2 344:4,7,12,13,15 344:16,18,19,22 347:2,6 359:16,16 360:8 figures 35:8 245:1 264:17 270:17 339:24 file 340:22 341:4 341:24 filed 8:16 files 300:13 filing 370:5	fill 119:24 final 350:23 finally 174:13 financial 250:5 financially 9:3 371:14 find 52:9 69:17 102:18 118:22 154:15 174:8 206:22 208:17,20 223:3 241:1 242:18 327:23 329:19,23 341:13 341:14 362:5 372:12 finding 102:21 213:23 216:16 217:4 219:9 222:6 222:19 224:6 240:17 241:10,14 341:20 findings 99:24 102:10,14 103:4 127:5 129:13 210:20,24 finds 241:3 fine 85:21 88:18 220:23 361:7 362:16 finished 109:7 fire 247:9 fires 98:17 firm 8:22,24 9:11 59:7 60:9 first 10:5 40:9 52:2 104:3 107:14 163:14 182:10 183:22 185:11 201:14 205:9 206:5 213:19,20 213:22 221:16,23	222:3 225:12,12 228:23 244:2 265:2 287:5 290:4 290:23 298:2 304:1 307:3 317:10,21 324:22 326:11,17 334:1 348:2,5 371:7 five 40:20 52:20 99:6,7 220:22 222:13 232:2 304:13 364:17 flesh 75:13 floor 2:6 flow 16:4 flows 34:16 focus 23:19 26:14 30:16 62:7 111:2 127:21 131:22,24 132:15 142:10,11 146:24 147:8,9 269:7 287:5 focused 26:9 29:16 56:8 142:8 197:16 215:14 300:20 focuses 112:15 focusing 49:14 56:7 60:18,19 199:11 folks 298:16 299:17 follow 303:11 305:18 316:16 362:5 followed 37:12,22 38:3,13 following 16:6,15 38:18 213:19 214:18,21 follows 10:5 17:6 51:14 99:12
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[follows - getting]

Page 24

151:21 166:16 221:4 271:12 304:24 307:9 369:8 footnote 50:7,7,7 force 93:9 109:10 forces 231:4,14,16 foreclosed 65:7 77:24 forego 304:5 foregoing 371:5 373:13 374:18 forewent 303:12 form 45:9 102:17 102:23 132:4 138:22 146:7 208:13 238:12 278:2,10,11,14 285:1 320:1,9 formed 89:12,23 149:17 151:9 350:13 forming 149:1,15 151:12 204:16 230:8 249:17 254:16 324:6 forms 319:22,23 323:13 formula 345:6 formularies 295:21 formulary 296:5 formulate 138:16 formulation 85:8 88:20 forth 11:20 16:5,7 16:8,15 258:4 371:15 fortunately 248:6 forty 371:15	forward 64:17 71:19,21 72:9 320:22 347:10,21 351:6 372:16 found 184:23 185:4 242:23 285:19 313:2 329:24 334:8 foundation 82:3,8 83:19 84:7,14 85:10,17 86:23 87:4,16 97:20 foundational 82:23 85:4 88:15 95:15 338:1 four 59:9 222:13 fourth 104:5 174:12 326:8 fraction 186:8 237:10,14,19 frame 193:14 266:22 267:11 framework 160:2 160:17 franklin 292:1 frankly 72:23 franks 2:15 free 223:17 373:14 374:20 frequency 22:20 58:23 89:10 328:18,24 329:16 329:21 friend 123:18 133:8 156:4 friends 114:14 124:14 125:2 155:17 170:1 front 71:20 99:20 250:1 369:1	froze 209:2 fruitful 66:5 full 30:20 59:14 60:21 62:5 152:4 265:2 290:5 298:3 302:17 371:10 fully 76:4 210:21 301:24 302:3,8 331:5 function 348:6,21 350:14 352:5 354:11 functioned 82:17 functions 82:11,16 funneled 295:1 further 9:24 65:10 85:23 93:19 147:19 219:13 228:22 321:20 327:19 330:8 331:11 332:8,16 339:9 358:16 369:14,23 370:6 371:8,11,13	146:9 147:14,24 148:24 149:13 156:12 158:14 162:1 178:21 179:10 196:10 198:5 215:12 237:7 259:8 266:2 279:3 284:12,21 generalize 127:6 153:7 219:12 generalized 70:21 77:9 79:7 102:8 102:11,20 129:14 144:18 generalizes 102:15 103:4 224:8 generally 35:7,22 39:3 120:22 127:4 140:1 145:18 146:5,8 148:1 159:4,5 198:4 210:22 214:2 234:21 266:2 268:20 276:10 282:20 284:5 293:5 297:4,15 299:24 301:3 302:24 324:21 generated 247:4 generic 61:22 62:4 70:1 71:10 85:14 85:20 generically 71:7 genetic 165:17 gentlemen 56:16 geographic 242:2 geographically 74:18,20 getting 83:3 170:3 343:17
		g 8:1 game 62:1,2 67:4 67:8 83:22 84:22 97:5 136:23 gamut 257:8 gathered 55:4 general 19:21 20:1 20:4 27:12 53:14 67:13 71:11 74:10 77:10 78:6,7,11,12 79:9,14,15,22 80:6 80:11 83:15 87:6 87:9,13,14 88:9 90:22 97:17,17,20 98:2 103:2 126:22 144:19 145:1	

[give - harder]

Page 25

give 31:2 38:11 51:21 52:19 56:5 78:15 90:17 95:2 98:15 239:20 249:1 304:14 320:1 323:14 367:6 given 60:14,14,23 64:6 67:3 72:13 130:6 138:5,12 188:10 200:3 201:5 203:8 238:15 244:15 251:13 253:22 267:21 288:18 314:8 332:2 352:18 370:1 371:17 gives 70:20 172:9 172:15 310:10 giving 139:22 306:8 308:2 gloss 90:23 gnat 88:2 go 8:11 22:14 23:18 34:5 41:10 42:2 44:10 45:23 45:23 47:7,12 48:4 49:13 55:2 57:3 64:17 65:20 72:15,20 73:16 77:16 80:2 83:14 94:12 139:22 151:15 160:5 166:11 177:9 193:12 201:20 208:22 209:4 212:23 229:14 251:2 259:22 266:23,24 271:17 278:2,10,15	290:21 292:1 304:11,19 307:3 317:21 335:4 341:2,4 344:13 346:1 361:14 369:2 goes 23:4 68:17 90:20 104:8 124:8 231:3 317:17 327:8 going 8:3 10:23 13:21 14:18 16:21 23:4,17,17 24:9,15 24:16 28:14,15 33:6,9 36:6 43:7,8 43:11 44:3 50:16 50:17 51:10,20 52:11 55:15,24 59:18 62:3 65:13 66:8 71:21,24 72:9,10 74:7,18 83:10 90:22 95:1 96:17 97:17 99:9 101:10 151:17 160:6 161:17 162:2,19,24 166:12 167:13 176:18 178:12 183:11 220:20 221:1 223:8 225:20 245:1 253:14,16 271:9 278:12 289:12 292:5 294:6 304:21 307:5,18 307:19 336:15,15 338:2 339:17 342:1 344:20 347:21,23 351:6 357:7 364:21 369:5	gonna 79:5 94:23 97:2 good 8:2 10:8 13:21 58:13 63:23 82:23 97:13 118:8 118:12,18 128:16 128:21 129:4 139:18 225:22 305:6,12,14 gotten 88:3 179:24 governing 299:22 government 19:3 148:4,16 247:10 governmental 148:9 grabbed 307:17 great 14:8 greater 121:10 130:1,10 158:11 313:3,7 314:12 ground 23:18 43:7 43:8 49:5 52:16 59:19 60:18 65:13 81:22 246:17,22 247:6 303:2 group 259:5 267:1 267:9 groups 286:23 guess 29:20 34:24 51:22 100:21 110:4 147:5 167:10 170:17 205:3 207:17 214:7 240:19 257:6 315:22 321:15 354:15 guest 361:10 guidance 125:23 126:1,4,11,12,15 126:16 128:6 262:24 263:1,3,5	guideline 5:5 134:24 135:6 137:4 guidelines 134:20 135:9,11,12,18,22 136:2,5,8,9,11,16 136:18,20 137:13 137:20 143:23 144:1 guys 66:7 87:24 88:1,10
h			
h 10:3 hager 3:9 8:22 half 173:2 235:2 halfway 30:22 31:3 32:15 hallmark 160:16 hand 29:1 42:23 137:1 164:24 218:24 371:17 handled 45:15 63:2 77:3 handwritten 247:21 299:3 handy 208:16 292:5 hang 79:20 happen 189:24 253:2 happened 94:13 happens 94:10 happy 16:23 304:12 340:15 341:3,15 364:12 harassment 43:22 hard 70:7,7 162:5 162:6 214:6 306:24 338:20 harder 83:4			

[harm - hold]

Page 26

harm 33:3 158:6,9 166:7,7 173:21 174:1 176:16 180:20 182:6 295:13 310:12 harms 111:23 112:16 113:10 152:24 156:13 158:15,22 172:10 172:15 294:9,13 hash 91:16 haven 164:13 head 31:14 88:7 158:24 164:16 257:17,23 269:23 349:18,19 headed 213:14 heading 42:24 100:21 105:6 212:24 213:8 260:4 health 2:11 6:15 9:20 37:19 39:15 40:3 62:19 136:4 148:9 159:8 192:7 305:7 366:24 hear 56:23 58:5,7 83:4 306:9 347:16 heard 64:23 70:6 88:1 92:22 heiman 2:5 9:16 help 187:13 250:3 349:5 367:10 helped 208:13 helpful 47:8 hereof 371:7 heroin 5:16,19,21 6:15 7:3 39:14 40:2 70:18 174:16 187:15 188:12,18 189:20 195:14,19	196:1,14,15 198:15 199:9,12 199:15,16,22 200:7,14 201:6 205:2,8,12 206:7 207:3,11 208:2,5 210:7,15 211:3,21 212:6,12,24 213:9 213:14,19 214:2 214:15,18,21 215:5,13,19 217:9 218:1,11,18 219:3 219:4,18 220:7,12 220:17 224:14,22 225:12,15 226:1,3 226:4,6,15,21 227:3,6,9,11,16,21 228:1,8,18 229:1,5 230:4,11 231:4,6,7 231:13,16,17,21 232:7,13,20,23 233:4,6,8,17,22 234:2,6,7,8,14,20 235:5 236:24 237:1,10,15,19,24 238:5,8,13 239:1,6 239:9,13,17,18,21 239:22,24 240:4 254:5 257:7 289:7 289:22 314:5,9,10 314:23 315:6,10 323:17 335:17,20 335:23 336:5,18 338:14 345:1,4,11 345:13 346:10 358:11 hesitate 29:19 hess 13:23 hester 3:3 4:3 9:10 9:10 10:7,9 14:2 16:14 17:8 23:7	23:16 24:6,14,17 28:9,13,19 29:2,4 29:12 31:11 39:8 39:12 43:14,24 44:5,11 49:6,12 51:3,8,22 52:1,21 52:24 53:4,17 54:1 55:7,19 56:3 56:15 57:8,16 58:10 60:8,9 63:18 64:8,18 65:12,14 67:18,19 70:5,6 71:6 72:19 72:20 75:20 77:8 77:16 78:1,14 79:19,24 80:15 81:1 84:15 87:1,2 91:9,16 92:13 93:15 97:12 98:19 99:1,4,16 101:9 120:17 121:3 128:19 151:15 152:1 156:6 161:22 162:5,23 163:2 166:20 216:1,6,10,13 220:23 221:8 223:16 245:7 271:6,16 277:22 278:5,9,12,16 281:17 282:1,4 301:5,17 303:10 369:19 hester's 60:4 69:12 82:1 heterogeneous 32:18,23 heterogenous 33:5 high 73:15 92:18 124:10 126:3 139:14,19 140:1,6	140:10,16 141:2,3 141:6,7,10,13,15 141:16,17,19,20 141:24 142:22,23 174:14 214:7,10 231:5 249:20,22 251:14 255:22 256:10 higher 145:3,7,12 145:13,22 155:15 157:9,10,19,20 158:12 182:1 211:4 214:1,3,4,5 214:8,15 217:9,10 217:15 226:15,17 226:21 228:8 237:14,19 249:14 250:17,19,21,22 250:23 251:3,6,12 251:17,20 252:9 252:16 263:19 270:12,23 288:17 288:24 291:10 313:12 316:2,6 320:12 321:1 328:8,15 329:6 331:4,6 highest 219:5 266:10 highlighting 156:8 highly 204:10,16 237:2 historical 290:9,14 histories 240:21 history 36:2 100:24 101:1 159:15 160:22 242:12,16 243:10 hold 51:19 57:3,8 79:21 84:1 353:20
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

holistically 164:1	82:18 89:11,14	i	172:6,12 173:9,11
homes 294:19	93:13 95:21	iatrogenic 6:3	173:11 174:24
hone 89:6	112:14 113:2	40:10,23 41:2,21	187:5,9 202:10
honest 204:3	116:8,13 125:14	41:22 209:15	253:23 254:1
340:9 367:23	125:17,22 126:4,7	218:7 221:12	illegally 112:1
honesty 282:3	128:8 131:24	icd 334:22	113:6 115:21
honor 64:23 65:23	132:2,6,17,23	idea 187:22	116:12 166:23
68:23 70:5 71:4,5	140:17 142:17	identical 54:10,21	171:5 172:19,21
72:16,19 74:4	144:9 166:23	54:23 59:16,17	202:2,6,16 204:1
75:20 76:24 77:24	167:7,16 168:9,14	62:4 69:9 81:4,9	253:17,21
78:1,14 79:17,24	168:17,21 170:5	101:6 161:8	illicit 108:17
80:24 84:12 87:1	170:24 171:24	178:19,24 182:3,3	111:17 159:15
90:6 91:2 96:6	173:13 178:7	identification 11:8	160:19,22 174:21
98:19,20	179:2,8,24 180:12	13:10 21:24 39:18	177:11 187:5
honor's 67:21 85:8	180:20,24 186:12	42:10 48:16	237:8 238:11,12
hope 50:2,2 90:11	187:10 208:6	100:15 103:22	238:17,18,19,23
hopefully 67:12	211:8 239:8,12	135:2 209:19	239:3 313:3 319:4
horse 97:9	241:20,24 242:3,7	210:10 218:14	319:9,20,22,24
hospitalized 124:6	242:15 243:1,14	224:16 288:6	323:12 326:19
hour 15:9,17	246:1,6,14,18	289:10 325:22	327:21 332:17
220:21	248:16,24 249:13	identified 33:22	333:13 343:7
hourly 15:8 16:10	249:19 250:3	113:16 172:16	347:12 352:21
hours 16:10 18:4	252:9 282:10	185:24 189:21,22	354:1,2 356:3,24
51:4 59:6 66:8	294:4,14 295:7	290:16	357:4,7,13
90:9 94:24 304:18	297:23 299:12,16	identifies 186:18	illicitly 174:7,16
341:11	300:9,15 324:7	188:17	174:20 175:2,4,9
house 158:20	359:23,24 366:24	identify 114:24	175:15,20 176:5
household 192:6	372:6 373:3 374:3	159:14 188:19	176:17,24 177:20
265:6 266:5,17,19	hypothesis 357:23	249:18	178:7,11,15 179:1
267:4,8	358:4,5,6,12,14	identifying 37:21	179:3,9 180:6,18
households 259:12	hypothesize	37:24 113:14	181:9,11,14,23
265:21 266:1	358:10	114:8 223:14	241:6
hudson 2:6	hypothetical	352:16	illustrate 187:13
huh 98:22 212:21	86:16 186:11	ignore 321:20	imag 181:9
247:19 336:21	187:13 361:8,9,19	ignores 94:12	imagine 82:9
hundreds 368:17	364:4,13	ii 2:15	175:1 177:2 214:1
hunt 186:12	hypothetically	illegal 112:17	220:2 251:13
huntington 1:4	362:1	113:5,8 115:15	255:21 270:18
8:15 20:10,14		155:16 156:1,7,18	285:8
21:5 67:16 69:13		157:5 168:8 169:2	immediately
71:9 72:7,12		170:6 171:21	162:24 260:3

[immediately - individuals]

Page 28

330:4 impact 69:4 impeachment 60:4 implementation 229:3 implications 77:14 implies 313:17 315:7 important 93:2,3 93:11,11 304:6 358:14 368:14,24 imposed 64:15 improper 96:12 96:17 inapplicable 162:14 inappropriate 203:1 262:13 inaudible 313:19 incidence 36:20 37:11 38:5 40:10 40:23 41:2,10,12 41:20 46:10,11,12 46:15,16 85:12 91:5,7 158:12 160:15 166:5 200:6,9 232:7 244:15 251:21 incidences 35:11 incident 5:10 37:16 48:12,20 200:2 include 20:17 30:9 35:14 36:6 37:3 46:11 106:16,18 112:11 141:21 194:8 232:20 243:7 245:15 251:18 254:8,23 255:7,24 257:12 267:17 269:19	270:8 275:14 286:4,18,20 287:7 332:9 336:24 342:18 344:18,19 included 20:20 34:6 37:17 38:19 113:9 140:18 175:14 207:18,20 243:9 247:14 266:11,22 267:10 267:10 280:11 337:19 372:14 includes 34:9 38:16 65:18 108:16 124:24 125:2,3 165:12 234:5,5 243:6 271:24 272:14 275:14 including 18:23 62:12 194:16 195:7 229:23 231:4 250:5 254:4 255:10,24 279:23 289:20 352:2 inclusion 26:10,17 29:23 30:9,13,15 243:7 inclusive 34:9 112:23 113:4 166:2 357:3 inconsistent 359:13 incorporated 374:12 incorrect 322:23 327:9 332:12 increase 33:2,2,9 131:3,6 132:2,8 133:17 149:5 152:7,16,16	153:18 154:7 156:13 160:24 181:15 227:3,16 228:24 229:4 232:5 233:4 234:10 235:5 236:15 237:10,16 260:14 279:22 293:9 295:12,13 317:23 320:20 322:11,13,19 323:9 increased 5:16 131:8 132:23 133:24 134:9,13 134:18 176:15 178:14 218:1,11 218:18 219:3,18 219:24 220:13,18 227:9,22 231:4,14 231:16,19,20 232:7,20 233:5 234:6 237:24 288:20 291:9 292:6 314:24 323:4 326:20 327:3,13,17,18,19 365:1,5 increases 131:12 160:20 173:18,19 227:5 231:7 233:17 291:6 295:10 increasing 109:11 220:7 290:7 291:12,20 292:15 292:22 293:18 295:5 independent 140:9 index 4:1 5:1 6:1 7:1	indicate 122:24 221:22 252:16 269:24 indicated 100:23 121:22 286:17 370:4 indicates 27:12 213:18 265:3 284:13 indicating 372:14 indications 45:5,8 45:11,17,18 283:19 288:21 indicator 309:15 indirect 191:22 192:19,19,20 193:1,16 194:2 197:8,20 200:22 308:17 310:19 337:4 indirectly 169:16 183:5 184:2,16 191:24 194:3 196:22 309:7 310:15 333:24 345:20 individual 124:6 157:23 159:11 166:8 182:22 188:10 191:1 194:9 195:7 196:12 233:13 234:13 249:4,12 250:5 251:19 300:21 301:2 individual's 188:14 individuals 5:11 30:22 48:13,21 105:22 124:9 160:16 168:10
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

200:14 205:7 211:13,20 212:5 212:11 215:4 313:12 industry 147:13 147:16 292:8 inequality 165:2 infer 179:19 202:11 314:15 358:21 inference 179:10 179:11 184:16 inferring 215:2 inflammatories 284:20 influenced 147:15 inform 85:3 119:2 356:1 informal 133:11 177:3 informally 168:20 information 29:18 32:11 37:9 38:2 38:17 44:15 47:6 48:2 65:19 74:23 77:6 117:4,6 118:6,8 138:5,11 139:3,7,8 147:19 150:14,21,24 184:19 203:21 220:12 275:23 278:22 279:11 283:10 314:21 326:10 327:23 328:2 329:19 339:10 345:8 358:15 informative 352:19,23 356:4 informed 143:10 143:12	ingested 224:1 initial 85:4 222:14 initiated 199:17 199:22 213:19 226:3 initiates 213:18 219:2 initiating 5:16 218:2,12,18 219:5 219:18 220:7,13 220:17 initiation 5:21 200:7 210:7,14 211:3 213:1,2,9,10 213:14 214:2,18 214:21,22 217:8 inject 366:16 injection 209:6 214:14 injury 27:1 inputs 138:18 inquire 60:16 68:9 68:16,22 69:17 70:3,12 72:3 73:9 75:2 76:4 77:7,19 78:13 86:11,15,20 88:21,23 89:20 301:24 302:2,8 inquired 67:4,13 89:2,24 90:3,21 96:21 inquiring 74:24 301:10 inquiry 55:23 56:1 56:5 59:10 62:1,5 62:8 65:19 66:23 67:6 72:11 77:21 77:23 79:13,23 83:11,17,23 86:3 87:13 88:13 95:9 96:4,10,20 302:12	303:12 304:5 insecurity 250:6 inside 314:21 insight 52:17 insofar 275:18 instance 53:8 68:5 199:5 instances 66:10 69:8 instant 200:1 institute 225:7 institutionalized 265:5 270:8 instruct 14:18,19 instructions 154:9 insufficient 159:6 229:18 306:4,16 307:23 insurance 295:21 insurers 295:15,19 295:24 intended 136:16 302:13 intent 60:17 interact 160:14 187:22 233:18 234:16 251:24 252:5 interacted 189:16 193:11 interest 199:2 352:12 interested 9:3 318:12,19 352:9 352:15 356:8,21 371:14 interesting 13:13 interfere 8:8 interference 8:6 interfering 24:7 24:12	interject 161:5 internet 305:13,14 interpose 22:17 178:18 281:12 interpreted 267:19 interpreting 358:15 interrelate 166:4 interrupt 16:4 46:19 142:15 interrupted 332:7 332:10 interviewed 123:17 introduced 59:9 232:17 introduction 318:14 320:19 322:21 324:14 invariably 238:12 investigate 322:3 324:8 investigative 300:13 invoiced 18:10,12 invoices 16:9 involve 60:24 involved 195:12 202:1 203:17 204:21 284:10 297:13 involves 50:11 284:2 involving 43:16 70:18 279:16 iqvia 140:19 260:18 ironic 43:14,19 issue 55:16 63:1,3 102:2,5 167:19
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[issue - know]

Page 30

298:20 307:3 308:5 354:21 issues 55:21 63:10 63:20 66:11,17,20 66:23 67:6,11,16 68:9 70:14,18 250:2 281:23 283:2 307:15 items 59:23	jump 82:5 jurisdiction 55:11 67:11 69:11 70:4 75:17 83:24 84:2 84:10 85:9 89:8 98:9 jurisdictional 66:20 67:11,16 96:10 jurisdictionally 71:22 72:18 83:12 88:12 89:18 90:24 98:8 jurisdictions 68:4 71:2 72:2 73:17 302:11 303:16 justin 3:9	11:5,6,8,13 13:6,8 13:10 14:4,6,13,22 15:7 16:18 17:9 18:19 21:19 22:1 22:7 23:9,20 24:18 28:11 29:3 29:6,15 39:13,18 39:22 40:4 42:4,8 42:10,12,15 43:15 44:12 46:1 48:10 48:16,23 49:8,16 49:19 51:8,16 53:7 54:22 59:4 60:10 61:11 93:24 99:14,17 100:9,15 100:17 101:15 103:17,22,24 134:23 135:3 151:23 152:2 163:3 166:18,21 204:24 209:13,19 210:5,10,17 216:14 218:10,14 218:19 221:6,9 223:17 224:12,17 231:24 271:14,17 279:15 288:2,7 289:5,11,20,24 294:3 297:2 299:10 300:18,19 301:7 302:1,13,14 303:13 305:2,6 307:11,14 325:19 325:23 340:1 342:14 369:10,12 369:20 370:1 371:5 372:9 373:4 373:9 374:4,13 375:20 kids 248:10	kilkenny 366:22 367:4,21,21 368:3 killing 364:16,17 kind 19:21 156:16 158:14,24 160:11 164:1 170:18 171:11 207:8 262:20 267:1 294:21 309:16 325:1 kinds 193:4 274:9 284:13 knew 204:18 331:4 340:16 356:17 knock 83:15 know 13:21 15:18 15:23 16:6 17:20 27:14 29:20,20 31:9,9,12 36:1 38:20,20 40:20 44:15 45:7,10,10 47:3,21 51:20 55:17 56:23 62:19 62:23 65:10 66:5 66:7,11 71:20 72:5 74:9,14 75:6 75:15 78:22 88:5 88:10,16 90:12 92:19 94:24 95:1 95:4,16,21 97:1,6 98:7,12 99:4 104:18 110:15 111:4 115:14 118:17 120:13 133:7,8 139:23 140:4,21 142:5,20 143:9 144:17 149:19 150:14,20 151:1,11,11 160:19 161:13,13
j	k		
j 339:13 362:2 364:5 jackson 371:2 jamison 31:4,6 jennifer 164:12,13 job 53:2 joint 291:16 journal 103:15 judge 43:11 50:18 50:21 51:2 52:4 55:1 56:12,17 57:5,14,17,21 58:1 58:3,5,11 60:8 61:19 62:18 63:10 64:5 67:18 81:23 83:5 85:7 86:4,5,7 92:6,8 97:8,9 98:4 98:21,24 302:4 303:18 judgment 116:24 117:3,5,11,23 118:9,12,18 128:1 128:11,14 185:7 185:20 252:20 judgments 117:19 118:3,5 127:17 128:15,17,20,21 128:24 138:16,23 263:14 july 5:12 48:15	k 10:3,3 katherine 1:19 5:3 6:18 8:13 11:6 13:7 51:16 59:3 99:14 151:23 166:18 221:6 271:14 305:2 307:11 369:10 370:1 371:5 372:9 373:4,9 374:4,13 375:20 keep 24:9,15,16 52:10 66:2 161:17 162:24 247:11,22 292:5 299:1,7 361:15 keeping 315:12 kelly 2:5 kentucky 164:14 kessler 2:15 kevin 22:3 keyes 1:19 5:4 6:18,21 8:13 10:8		

161:22 164:7 165:24 168:10,20 170:13 171:12,14 171:16 172:18 173:3 175:1,23 178:10,14 179:7 179:15 180:22 187:20 188:13,15 190:4 195:17 196:4 198:6 201:5 202:4,5 203:3,12 203:16 204:3,6,19 204:21 208:16 210:22 214:6 219:8,21,24 225:5 225:9 228:15 230:14 233:7,8 235:20 237:12,18 239:7 245:4 247:16 248:13,15 250:4,7 252:1,15 253:8,19 255:2 257:17,23 261:11 261:24 262:6 264:14 269:22 270:15 276:4,13 281:2,4 288:11 294:18,21 295:19 301:19 303:17 304:15 306:9,15 310:10 314:8 316:23 319:16,19 320:4 325:3,5,10 328:11 332:23 341:1 343:4 344:14,16 345:6 345:10 349:20 351:2 364:9,24 365:4,7 368:12,22 knowledge 19:19 19:21 20:1,4,5,8	20:13,22 27:6,9,17 27:18 36:11 75:24 83:24 126:23 138:10 140:5 150:8 175:3 177:1 181:7 191:6 220:16 240:8 312:6 341:22 342:15 knows 341:20 kolodny 6:16 39:16 40:1 I I 60:1,2 labor 145:20 laced 181:15,24 254:19 323:22 laces 196:1 lacing 195:14 lack 302:21 laid 82:8 language 46:8 69:8 113:12 141:20 162:9 large 66:18 84:20 215:16 248:18 largely 147:13 larger 239:22 largest 233:21 lark 227:12 larney 243:5,5,9 254:15 312:18,19 313:2,9 314:14 lasting 30:6 late 341:17 law 9:11 10:12 law's 88:5 lawful 167:17 177:11 178:1 lawfully 170:11,13 171:13 175:21	181:22 laws 299:22 lawsuit 84:3 lay 82:3 83:19,20 97:20 285:6 lead 87:6 94:5,7 145:7,15,22 233:5 353:12 366:5 leading 82:13 leads 105:1 145:13 153:23 173:20,24 194:18 231:20 232:6 learning 256:20 leave 17:1 52:7 110:7 111:3,21,23 112:4,20 114:7 115:6,9,17 116:4 119:17 177:9 294:10 leaves 293:13 led 108:12,21,24 132:2 152:18,19 152:19 158:6 230:2 262:6 leeway 74:13 78:2 84:7 95:2 left 42:23 56:18,18 109:17 110:23,24 111:13,18 114:3,4 123:6 137:16 178:1 leftover 110:15 legal 108:17 171:21 172:12 173:9 202:10 253:23 254:2 257:11 372:1 375:1 legally 172:19 202:17	legitimate 16:17 16:21,22,22 26:24 27:5,6,10,15,17,23 125:10 127:22,24 128:6,9 129:5 203:6 272:5,9,20 273:1,3,9,15 287:9 legitimately 241:12 272:12 length 34:4 43:9 161:10 162:17 lethal 313:16,21 314:5 315:5,14,18 315:21,23 316:9 lethality 313:3,7 314:1,13,19 letter 372:20 level 31:22 33:7 34:24 92:19 125:21 129:9 134:10,18 137:23 165:1,7,17 166:4 235:14 238:7 246:2,7 248:22,23 249:14,20,22 250:14,20 251:5 251:11,17,20 252:8 258:1,16 261:4 262:7 264:5 264:6 287:1,12 288:20,23 levels 31:18,19,21 32:2,6,8 47:21 48:6 50:12 94:7 120:4 137:21 144:18 145:12 148:20 235:2 249:9 250:11 260:2 licensed 19:2 158:18
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

licenses 296:12,19	153:15 184:22	290:10,15 295:22	178:10 324:13
licit 357:7	185:1 186:13,22	296:8,14,22	longer 30:6,10
licitly 177:3,7,8,17	191:5 208:10,17	297:24 300:1,3	248:5
181:10	208:20,24 209:3,5	306:16,19 308:7	longitudinal 207:7
lieff 2:5 9:15 10:12	290:21 298:17	322:5 336:14	longstanding
58:12	317:9 326:4	litigation 11:17,23	236:20
life 100:8 250:9	367:10,14	15:19,20 16:1,11	look 28:5 30:17
291:1	listed 13:1 184:14	16:19 17:11,22,23	32:12 39:4 40:7
lifetime 159:15,17	184:19 185:21	18:5,15,22 23:10	42:22 47:12 48:5
200:7,7 255:16,19	187:21 188:1,5	49:15,17 60:11,13	50:6,15 71:12
270:20,24	190:5 191:24	60:15,17,19,23	100:3,20 103:9
light 80:2	193:19 203:24	61:2,4,16,18 64:11	104:22 107:10
lighting 305:13,14	290:23 298:10,13	64:13,21 76:3	109:8 113:19
limit 22:20 58:23	298:19,22 327:24	77:20 78:21 86:2	136:7 139:11
65:8 66:3 86:19	345:13 374:7,17	205:16,16,23,24	140:3 142:3 155:5
limitation 74:15	listing 374:7	303:16,23 355:18	163:3 164:23
302:9 368:8,22	lists 185:17 187:15	litigations 205:20	167:22 183:3
limitations 64:16	188:24 191:11	little 29:13 54:7	184:9,12 193:3
75:23 258:13	literature 25:18	55:14,15 64:3	198:18 208:4
368:14,19,21,24	25:22 26:4,5,7	67:5 70:7,7 79:1	209:11 212:14
limited 27:13	27:11 29:8 84:20	89:7 108:6 149:8	217:21 221:9,15
66:12,13,16,19	121:22 124:21	157:7 182:7	221:19 222:21
74:7,18,20 75:19	125:23 126:23	203:11 206:16	224:9 225:1 228:6
76:22 86:23 92:12	127:9,10 129:12	245:15 255:24	235:18 236:1,3
108:22	129:18 134:3,16	261:6 306:10	241:17 244:1
limiting 67:10	139:20,24 140:7	314:11 321:16	248:21,23 249:11
111:22	140:13,15,20	326:22 345:24	250:13 252:14
limits 90:1	141:11 143:24	361:15,23	253:14 258:22
line 80:16,22	144:6,17,20,22,23	live 75:11	259:11,18,22,23
161:9 174:12	145:5,10,23 146:7	living 212:22	263:19 264:6,24
339:18 372:14	146:22 147:12	248:5	267:22 268:18
374:7 375:3	148:24 149:14,15	lobbying 292:12	269:18 279:20
lines 82:9 285:13	151:5 152:5 153:6	local 165:11	287:16 289:3
302:12 303:12	153:12 154:5,18	168:17 298:4,8	290:3 298:1 317:9
304:5 306:4	156:20,22 168:5	located 1:21	319:13 320:5
lingo 256:21	169:21 175:6	logan 2:20	324:23 325:8
linkage 242:11,16	178:17 184:15,17	logic 13:19 311:9	339:19 345:5
242:22 243:1,9	192:24 193:4	313:14,20 347:24	348:11 357:9
liquor 158:11	196:14 215:2,17	351:23 353:10,12	360:18 364:22
list 12:11,22,24	240:6,7,9,20	long 40:11,24 41:3	367:19 368:16,23
55:22 135:21	250:18 257:22	47:3 176:17	

looked 142:22 184:11 207:2,23 216:17 223:2 227:20,21,24 230:12,12,18 239:23 240:4 246:23 264:12 283:1 288:23 354:10	m	manufactured 174:7,16,20 175:2 175:4,7,10,15,20 175:21 176:5,18 176:24 177:4,7,8 177:18,20 178:8 178:11,16 179:4,9 180:6,19 181:9,10 181:11,14,22,23 204:1 241:6,12	276:5,7 277:1,2 279:3,18,24 280:5 280:6,9,9,12,14,17 280:19,21,24 281:1,2,4,6,7,8,23 282:5,9,14,15 283:2 284:1,6,9,14
looking 21:15 36:5 46:1 75:17 135:20 156:22 182:20 200:6 201:8,11,12 201:13,24 208:20 212:16 217:5 223:15 244:18 260:20 263:23 266:13 271:1 300:17 341:24 367:12	macro 165:1,7 166:8 madam 372:10 mail 28:15 340:20 mailing 341:13 main 98:17 maintain 181:8 249:23 250:4 maintaining 88:24 89:1 majestro 2:8 9:22 major 231:6 majority 62:11 66:17 85:1 179:16 179:19,22 180:11 202:20 203:2 223:24 226:1 228:24 239:5 253:24 275:2	manufacturer 276:24 manufacturers 19:12 274:18 275:6,20 276:18 277:6,11,16 278:18 280:7,16 280:18,21 281:3,5 283:12,17 284:4,7 284:11 manufacturing 174:21,23 275:3 map 88:11 mar 5:3 marijuana 257:7 mark 48:19 marked 11:7 13:9 14:12 21:24 39:17 42:9 48:15 100:14 103:21 135:2 209:18 210:9 218:13 224:16 288:6 289:10 325:22	marketplace 106:7 108:17 111:17 178:7 237:8 markets 155:16 156:2,7,18 157:5 168:17 martins 7:4 289:9 289:20 maryland 240:9 master 58:6 62:15 64:2,24 65:20,24 68:15 71:18 72:17 74:5 77:4,15,17 78:10 79:21 83:7 86:9 87:24 90:11 91:19 92:2,7 94:17 96:24 98:5 98:22 161:17,24 281:16 302:20
losing 64:2 lost 17:13 335:6 lot 44:19 98:6 124:22 160:22 196:13 215:10 226:24 248:10,10 250:2,8 303:1 309:11 310:8 340:12,17 360:8 367:23 lots 198:7,8 low 225:15 226:6 lower 200:18 266:2 328:8 lucky 212:18 lunch 161:21 166:14 lung 198:6,7 lying 294:11	making 94:1 107:20,24 117:10 117:19 118:9,18 128:21,24 129:4 131:20 148:22 157:8 235:10 252:20 253:7 280:6 management 126:19 managers 296:5 managing 43:3 81:14 maneuver 79:1 manipulation 348:13 manner 82:11,16 82:18 352:18 manufacture 175:12	mark 48:19 marked 11:7 13:9 14:12 21:24 39:17 42:9 48:15 100:14 103:21 135:2 209:18 210:9 218:13 224:16 288:6 289:10 325:22 market 20:5 21:4 21:8 196:13 227:17 231:4,13 231:16 232:18 237:1 282:19,20 marketing 274:8,9 274:15,22 275:15	master's 303:6 material 60:6 62:6 69:1 94:15 148:13 281:5 282:12 284:13 295:18 326:5 339:4 materially 357:18 materials 12:9,11 12:11,14,16,20,21 12:24 13:2 85:15 148:19 208:24 209:5 247:14 281:9 282:24 283:7,21,24 284:3

284:5,11 367:14 mathematical 345:6 346:2 matter 8:14 15:8 56:21 74:11 94:24 281:13 303:2 340:2,5 352:11 353:20 354:21,22 matters 16:1 53:12 324:17 mccabe 6:9 100:5 100:14 223:4 mckesson 3:2 9:11 60:9 67:19 72:20 mclellan 5:8 103:13,20 mcnabb 2:5 mdl 58:13 59:5 66:19 67:14 74:9 mean 12:8 18:8 21:2 23:8 29:19 29:21 32:22 33:6 35:1,14,18,24 36:12 43:17 44:21 46:9,18,18,19 50:6 53:21 55:8 62:9 75:20 78:24 93:21 102:2 103:7 105:17,20 106:3,9 106:14,24 125:7 129:3 133:13 139:18 140:1 142:4,15 147:5 152:14 157:16,20 157:22 159:3 167:4,5,11 169:14 169:18 171:10 172:11 175:16,18 177:2,8,13,14 196:13 204:5 211:2 212:4 214:6	216:12 226:22 233:7 244:15 246:8 249:21 252:3 256:20 257:9 261:6,16 268:11 281:19 283:8 285:17 291:23 293:4 308:24 315:22 319:4,7 322:8,10 327:7 330:8 344:7 350:9 354:16 358:4,9 360:8 meaning 69:4,14 154:19 170:16 363:16 meaningful 143:1 286:24 means 33:1 34:18 41:21,22 46:23 105:24,24 109:16 175:10 244:15,17 256:22 266:6 292:3 293:5 339:15 358:4 meant 35:2 45:4 136:9 137:9 180:4 308:6 336:17 350:11 measure 41:10 197:4 200:9,11 239:14 measured 34:8 238:4 332:17 measurement 217:2 271:2,2 measures 41:2 46:16 measuring 33:14 33:21 35:11 36:21 37:1,11 200:1,2,5	254:3 mechanics 11:11 52:2 334:3 media 8:12 51:15 99:13 151:22 166:17 221:5 271:13 305:1 307:10 369:9 370:2 medical 19:8 26:20,24 27:5,7,10 27:18,23 35:23 43:2 81:12 100:23 101:1 107:8,15 108:4,17 109:1 116:22,24 117:8 117:10,19,23 121:9,15 124:23 125:5,7,10 127:2,4 127:8,11,22,23,24 128:1,6,10 129:9 129:12,16,17,19 139:5,8 147:9,15 149:14 172:1,3 180:1 182:11,12 185:8,16 186:18 186:22 187:16 188:16,18,24 190:23 191:3 202:23 203:8 215:11,17 265:4 268:21 272:9 286:9,14,22,22 290:24 293:6,22 295:14 medically 121:24 124:23 127:18 128:22 129:5 137:12 253:21 272:12	medicare 286:6 medicating 42:24 medication 123:1 124:13 133:12,13 138:20 152:24 173:6 235:22 284:21,22 293:7 medications 110:14 293:13 medicine 103:16 110:16,18,22 294:11 296:11 medicines 138:17 138:24 meet 34:23 120:4 meetings 299:19 meets 371:15 members 114:18 114:23 124:4 memory 169:21 339:23 mental 266:6,15 mention 16:5 71:13 308:19 mentioned 48:8 62:13 93:22 133:7 144:3 230:10 251:18 282:13 354:10 mere 62:8 merit 1:21 message 52:7 56:18 met 299:17 305:8 meta 243:6 methadone 314:24 methamphetamine 258:3,18 methamphetami... 257:20
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

method 315:18 methodologies 184:7 259:16 methodology 122:11 183:23 185:20 190:6 192:3,12,18 196:17,21 197:2,7 201:2 250:24 259:17 266:23 267:6 309:13,21 311:8 312:19 315:20 316:9 320:18 321:3,3,5 321:19 322:17 332:5,12,13,24 334:7 338:9 345:16 methods 332:14 366:2 metric 291:17,24 327:2,16 metz 2:12 4:4 9:19 9:19 301:15 304:10,11,19 305:5,7 307:13 341:8,18 342:8,13 369:12,18 michael 366:22 micro 165:16 microphone 51:20 microphones 8:4,8 mid 100:8 middle 30:20 113:24 155:13 163:5,6,12,15 242:9,10 285:12 midlife 6:8 100:13 midst 73:4,12 76:9 80:10	midwest 372:17 375:1 million 104:7 mills 141:15 mind 41:14 45:18 53:19 62:24 66:2 68:14 116:6 131:11 135:14 136:2 145:24 146:1 149:3 173:1 206:3,11 240:11 240:15 262:17 357:23 368:20 mindful 66:14 mine 53:3 minority 172:22 173:1 179:13 180:5 202:11 minus 339:14 minute 13:22 29:15 39:9 42:3 99:6 134:19 136:8 209:2 220:22 336:16 361:13 363:1 minutes 29:11 52:20 59:8 271:7 304:13,18 363:2 mischaracterizat... 129:6 mischaracterize 287:22 mischaracterizing 278:7 misconceptions 5:7 103:14,19 misleading 79:18 117:6 118:6 278:4 278:8 missed 338:12	misstates 216:21 276:19 misunderstood 330:18 350:6 misuse 5:13 21:20 22:4 33:16,22,24 34:7,8,17 35:6 36:6,7 38:6,12,22 39:1 71:10 85:13 94:6 106:12,17,19 108:8,12,21,24 152:19 153:8,23 158:3,6 164:21 165:14,21 173:21 202:21 203:2,5,10 215:8 240:18 241:2 250:20,22 251:5,8,11,17,20 251:23 257:8 271:24 272:4,8,13 272:15,20,22,22 272:24 273:11 286:5 287:8 293:14 misused 253:17 254:24 misusers 173:21 286:4 misusing 34:20 273:4,7,9,14 mitigation 5:7 103:15,19 mix 186:4 239:21 357:7 mixed 188:12 207:8 239:6 mme 263:20 264:11,12,14,18 264:22 modal 110:13	modeling 309:12 models 259:15 moderate 34:13 35:4,15,18 molly 2:19 9:17 moment 29:1 31:2 56:22,24 58:17 326:2 362:21 368:23 monetary 275:1 money 156:4 monitoring 230:1 262:19,22 300:6 montana 94:9 month 267:13 268:2,16 270:19 271:3 months 30:6,10 81:19,19 moot 354:3 morbidity 109:11 165:20 morning 8:2 10:8 28:24 58:13 mortality 109:11 284:17 285:9,15 285:19 287:6,7 288:9,12,14,16,24 313:1 322:11 323:4 328:5 motion 58:22 mouth 82:1 move 29:11 90:23 215:24 304:9 346:24 moving 71:19,21 72:9 mr.arbitblit 96:5 muhuri 5:22 210:8 210:13 211:24 212:3,14 215:3,18
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

215:22 216:16 217:4,13 muhuri's 215:14 multi 158:22 159:1,3 160:2 161:11,20 194:5,7 262:9,11 multiple 119:7 124:10 159:8 185:10,13 189:8 190:17,18,20 330:22 333:6 335:16 338:17 355:11 multiplied 315:4 multiplier 314:6 316:1,7,18,18 317:4,7 318:19,23 321:18 322:10,20 324:14,15 326:9 326:18 327:10 330:3,9 331:8,15 multitude 279:23 mute 80:20 muted 80:14 mutually 338:7,11	nationally 227:6 228:4 244:12 nationwide 70:1,2 144:24 nature 145:8 330:18 333:13 necessarily 35:20 109:19 114:5 119:13,16 123:19 124:1 130:13 154:22 necessary 82:14 82:24 87:19 160:7 160:18 187:3,23 188:2 193:10 194:12,18,20,22 195:3 197:14,22 234:18 need 13:15 23:7 24:10 29:10 39:7 39:10 63:10 66:1 66:1 68:8 70:11 78:2,2,24 79:9,15 80:20 82:7 87:15 89:23 92:9,10 99:2 127:2,22,24 128:1,6,10 129:9 129:17,19 139:22 140:3 145:23 147:8 161:5 233:9 234:7 266:23 281:11 293:6 312:24 314:18 324:23 327:22 328:10 333:17 340:13 341:2 345:5 360:18 361:5 362:24 364:22 368:16 needed 14:24 120:4,14,15	121:11,24 122:4,6 124:23 125:18,21 126:7 127:18 128:12,15,22 130:2,11 needs 78:7 82:3 85:8 90:15 125:5 125:8,10 127:4,8 127:11 144:9,15 145:3,7,13,22 298:5,22 neighborhood 326:21 neither 16:9 371:11 network 177:10 networks 133:11 177:3,19 179:18 neurobiological 165:18 never 112:4 198:8 new 2:7 10:13 12:10 15:20 23:9 24:3 34:4 43:9 49:3,4,6,10,11,13 53:8,19,21,22 54:3 54:7,20,21 55:9,9 55:10,12 59:5,19 59:22,24 60:11,12 60:18 61:2,14,17 61:23 62:6,9 65:13 68:7,12 69:5,10 70:10,22 73:2,8,13 74:24 75:7 76:11,11,20 77:11 78:18,21 79:14,16 87:14 91:12 96:20 103:15 161:9 178:19 205:16,23 224:10,11 281:23	297:20 nexus 281:14 nicotine 255:7,11 256:1,11,17 nida 135:23 night 14:1 nmpr 213:1,10,18 213:20 214:21 nmupo 100:24 101:2 223:23 nodded 146:2 350:17 non 101:6 107:15 265:4,5 268:21 291:1 314:24 noncancer 5:11 26:9,16,21 29:24 33:15 38:10 46:3 47:1,4,11,23 48:14 48:22 noncounterfeit 181:5 204:7 nonhouseholds 266:21 noninstitutionali... 266:1,5,17 267:24 270:5,7 nonmedial 5:18 224:13 nonmedical 5:20 6:7,20 7:3 35:23 42:6,17 100:6,10 107:21 108:1 109:1 113:23 123:16 131:2 133:16 155:18 163:9,19,22 164:5 167:24 199:10 200:8 202:24 203:8 206:21 210:6,14 214:19
n			
n 8:1 10:3 60:2 n.w. 2:13 naive 221:24 name 8:21 10:8 164:15 305:6 372:6 373:4,15 374:4,21 names 298:10,11 narrow 67:12 national 85:2 89:12 93:8 167:20 184:20 192:6 225:6			

[nonmedical - objection]

Page 37

215:11,15,19 223:5 224:21 225:14 226:5 228:19 230:10 242:12,17 243:2 243:10 265:11,13 265:22 267:14,16 268:1,8,16 269:8 270:2 286:10,23 287:1 289:7,22 293:15 nonmedically 167:21 169:22,23 180:16 226:3 286:15,19,21 287:4 294:20 nonmedicine 267:19 nonprescription 192:8,9,11 nonreliable 319:1 nonsteroidal 284:20 nora 103:13 nos 8:18 notarized 372:15 notary 371:4 372:24 373:10,18 374:15,23 375:23 note 8:4 63:13 223:11 260:12 372:13 noted 9:24 229:17 305:20 334:5 336:6 notes 247:11,14,16 299:1,3 300:17 371:9 notice 1:20 13:14 63:20 65:3,10 73:11 74:6	noticed 212:16 noticing 9:9 novo 139:9 nsaid 285:10,16,21 286:20 287:3,13 287:15 288:9,17 288:24 nsaids 284:17,19 285:1,6 287:1 nsduh 192:6 199:9 199:11,14,15 201:5 265:12,13 265:24 266:22 267:18 269:11,12 269:13,24 270:8 nuance 44:19 nuanced 80:1 nuisance 68:20 number 16:10 37:18,18 41:11 56:19 66:2,13,14 68:1 89:10 106:11 126:16 127:12 140:2 173:1 181:20 190:11 194:16 199:20 203:20 207:19 211:13 214:14 229:23 234:1 235:18 241:20 254:17 256:13 258:3 261:20 262:13 270:12 286:20 311:24 313:16 314:15 315:6,13 316:6,23 321:21,22 322:13 324:24 325:17 328:8 329:3 330:14 331:12 332:17,20 333:16	347:12,21 349:12 351:6 352:6,8,8,16 353:17 354:4 357:16,21,24 358:1 360:2 361:24 366:15 368:8,18 370:1 372:8,14 numbered 367:16 numbering 13:20 numbers 25:6,7,10 25:11,16 40:22 183:10 200:18,21 212:17,19,20 223:13,18 246:10 258:6 260:21 261:14,16 264:10 311:13,17 312:2,3 349:23 367:11 374:7 numerous 119:6 nw 3:6 ny 2:7 o o 8:1 60:1 o'clock 307:6 oath 9:2 53:13 obesity 145:12,19 object 23:5 45:9 102:17,23 132:4 178:24 225:21 278:14 287:11 301:13 339:17 objected 78:19 303:4 objecting 62:8 178:20 objection 20:24 22:18 27:3,20 28:1 33:13,17 34:3,22 36:9,24	37:8,15 38:7,14 39:2 43:6 44:23 45:19 46:13,22 47:5,24 49:2 55:3 55:8 56:12 101:5 101:19,24 105:16 106:2,13 111:15 111:20 117:2,14 117:21 118:14 119:15 120:5 125:11 126:8,20 127:19 128:3,13 128:23 129:10,21 130:7,17 133:19 134:11 136:12,19 137:19 138:9,19 140:12 141:22 142:2,6,18 143:8 143:14 144:11 147:4,10,22 149:7 151:4,8 152:22 153:10 154:2,21 155:1 156:23 157:12 159:23 161:2 167:1 169:19 173:23 178:19 180:3,14 182:16,23 186:7 186:10,24 187:19 188:7 189:23 190:13 191:2 192:16 194:24 195:10 196:20 197:6,13 200:24 202:22 203:7 215:9,20 216:20 217:14 219:20 226:13 228:14 229:11 234:4 235:3,16 237:17 241:15 257:4
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[objection - old]

Page 38

262:3 263:17 272:11 273:2 274:5 276:19 277:10,19 278:2,9 278:11 279:1 281:12,15 283:4 286:11 294:15 295:8,17 302:7 303:24 304:2 317:2 318:9 319:11 321:7,24 322:15 323:6 328:20 329:10 330:21 331:17 332:22 333:19 342:23 343:15 344:3 346:5,12,18 349:17 350:5 356:13 358:2,17 359:1,4,10 363:23 objectionable 98:14 objections 9:7 50:22 277:23 observation 157:8 165:6 observed 290:8 316:4 obstructionist 17:5 338:24 obtain 119:4,11,22 167:20,24 169:23 169:24 170:1,18 293:7 obtained 108:16 113:6 123:17 169:12,15,16,17 171:13,15 obtaining 110:14 obtains 110:21	obvious 244:23 305:15 obviously 73:1 occasions 176:1 185:16 occur 116:3 187:23 188:2,5 193:11 225:15 226:6 occurred 54:4 107:16 108:2 114:9 131:3 133:16,22,23 134:8,12,17 189:10 190:15,21 190:24 276:13 280:9 283:20 314:16 occurring 74:21 112:13 113:2 116:8 274:23 279:4 329:3 occurs 113:9 156:11 188:9 282:21 324:5 october 371:17 odds 101:2 odud 101:2 offer 55:10 111:9 112:16 113:7 115:2 279:5 308:24 362:9 offered 76:8,17 362:7 offering 112:8,19 117:24 118:1 120:12,23 342:2 365:21 offers 113:3 office 52:9 305:12	offices 10:12 official 373:15 374:21 officials 247:10 298:4,8 oftentimes 74:18 118:5 oh 13:16 14:2 31:6 39:8 45:16 148:7 155:8 163:16 165:5 193:18 212:20 242:23 251:8 270:22 277:15,22 289:14 299:17 336:8 ohio 15:19 60:13 61:18 68:8,12 69:5,10 70:10,22 73:3 76:11 77:12 79:14 87:14 91:13 94:9 205:16,23 281:23 372:2 okay 11:2 13:18 13:21 14:8 17:15 17:18 18:13 29:2 29:12 37:11 39:12 50:20,21 51:3 52:3,18,24 55:22 56:10 57:18,24 62:15 65:20,24 92:2,7 99:7,8 100:3 102:9 104:22 105:7 106:5,10 107:13 121:2 124:11 126:18 136:7 139:18 144:5 151:14 166:10 182:19 183:13 193:21 195:2 199:3,11 201:20	201:22 207:6 208:12 209:8,11 209:23 212:8 213:7 217:16 218:9 224:18 235:24 236:2 242:5 244:10 245:18 246:21 256:20 257:14 266:9,12 271:1,6 271:20 275:16 277:22 289:16 298:12 299:7 301:4 304:10,19 306:2 309:18 310:22 311:12 313:6,20 315:2,12 316:5,13 319:2 322:6 325:2,16 326:17 327:1,23 328:11,22 330:2,7 333:4,22 335:3,3 335:15,22 336:15 339:3,6 341:8 342:8 343:11,17 344:12,17,20 345:8 346:24 347:9 348:17 349:5,14,19 350:18 351:5,11 353:16 355:23 358:20 360:19 361:17 363:8,11 363:18 365:4 366:21 367:3,6,16 368:2,10 369:2 old 40:20 43:7,8 49:5 59:19 60:18 65:13 81:18,22 88:1
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[older - opioid]

Page 39

older 6:12 288:4	opinion 67:2,6	opioid 5:7,9,10,13	192:14 193:3
omitted 121:16	68:18 69:3,19	5:16,18 6:3,4,14	194:13,17,20,21
once 71:14 95:11	71:24 75:5,12	6:20 7:2,4 15:19	194:22 195:1,3
95:11 106:1	76:2,7,17,23 77:9	15:24 16:11,18	197:15,18,18,20
114:19,23 177:6,8	79:3 82:10,12,15	21:7,20 22:4 26:1	197:21 198:3,9,14
177:14,14 223:12	84:1 85:20 87:4	27:24 31:22 32:17	199:6,10,17 200:8
227:15	88:21,22,24 89:2	33:4 34:10,13,23	200:15 201:3,17
ones 28:9,11 130:5	89:12 90:1,22	35:4,15,18 36:2,22	201:19 202:16,24
200:21 206:11	91:10 92:20,24	36:22 37:1,4,12,22	203:24 204:2,4,12
210:24 241:1	93:16 97:3,22	37:24 38:5,9,23	205:12 206:7,21
251:18 273:15	105:4 108:6,7	39:14 40:2,10,23	208:1,5 209:15,17
277:7,12,13,20	111:10,22 112:8	41:2,21,22,22 42:7	215:12 218:2,7,12
284:10 289:12	112:16,23 114:12	42:17 43:2 44:21	218:18 219:1,5,18
290:21 298:13,21	115:2 117:23	45:1 46:5,7,24	220:7,13,17
ongoing 248:7	118:1 119:3	48:11,12,20,20	221:12,23 222:3
onwards 349:11	120:12,24 121:21	61:22 69:12 81:12	222:15 224:14,22
ooo 370:8	130:9 149:16,18	85:13 94:6,8	226:24 227:14
op 184:12	150:13 170:23	103:13,18 104:4,8	229:1 230:2,3,11
open 10:24 11:2	172:21 179:12	105:1,9,10,14,21	230:23,24 232:16
11:10 13:5 14:8	181:2 205:1	106:15,16,18,22	234:16,17,18
217:24 218:3	207:10 217:20	107:1,4,16 108:2,8	235:1 236:21,22
275:24 276:23	226:22 227:11	109:11 110:14	236:23 237:2
325:16	249:17 250:1	112:15 123:16	240:13,18 241:2
opened 134:22	256:1 279:5 351:9	124:4 125:24	241:12 242:12
217:23 222:24	357:17 365:22	126:12,22 129:7	243:10,11 244:11
opens 66:23	opinions 11:19,22	131:14 132:22	244:19,24 245:10
operations 20:9,14	12:7,15,17 13:3	133:22 134:5,8,16	248:2 249:24,24
20:22 21:2	20:12,16,17,20,23	146:13 149:1	250:14,20,22,23
operator 8:2 9:23	49:16 55:10 60:16	152:6,7,11,17	251:3,5,8,11,17,22
51:10,15 57:18,24	60:22,24 61:15,23	153:3,8,17,18	251:23,24 252:5,8
99:9,13 151:17,22	64:12 68:1,6,9,11	154:7,8 156:4,13	253:16,24 254:4,5
166:12,17 221:1,5	70:13 71:23 76:1	160:7,18 163:9,19	254:9,14,15,23
271:9,13 304:16	77:8 83:16 85:3,5	163:23 164:17,20	259:15 260:4
304:21 305:1	85:18 91:1 97:17	165:14,21 176:5,7	267:19,20 268:22
307:5,10 369:5,9	97:20 98:3 101:8	176:9 177:15,18	269:8 270:2
369:22	112:19 113:7	180:22 181:11,14	271:23 274:22
opiate 181:7	146:7 148:15	181:20 182:9	275:2,13 276:5
326:19	149:1,3 151:7,10	184:13 186:5,19	279:3,22 280:1,10
opined 75:7	204:16 205:15,18	188:9,24 189:2,10	280:15 285:16,19
opines 84:1	208:14 300:20,23	189:15,18 190:3,5	286:3,4,4,18,20
	365:21	192:8,9,10,11,11	287:6,8 289:6,8,21

[opioid - originated]

Page 40

289:23 290:7,17 291:6,10,13,20 292:8,13,16,22 293:2,10,19 294:3 294:9,13,22 295:6 296:15 300:1 306:19,20 309:11 309:22 320:22 322:17,18 323:22 325:13 327:8,21 334:5 335:8,12 336:7 337:20,22 337:23 343:8 346:7 347:8 349:9 351:18 352:4 353:1 354:11 356:18 357:1 358:11 361:17 362:4 363:11 opioids 5:5 6:7,17 13:7 18:24 19:3,9 19:12,16 20:18 21:11 26:15,20,20 26:23 27:5,7,10,13 27:18 29:17 30:10 30:14,23 33:16,24 34:17,20 35:6,17 35:19 36:7 37:5 37:13 38:6 45:6 45:14,21 46:3 47:4,14 50:12 68:5,6 70:1,17 78:17 81:6 82:11 82:16 89:10 91:6 94:5 100:6,11 101:2 105:23 106:1,4,9,11,12,14 107:8,18,21,22 108:3,16 109:13 110:3,8,9,17,20 111:17,23,23	112:1,18 113:4,5 113:22 115:5,8 116:23 117:11,20 118:4 119:23 120:3 121:8,23 122:4,5,24 123:6,6 123:17,22 124:9 124:22 125:6,10 125:13,14,16,21 127:3,5,8,11,13,16 128:8 129:13,19 130:1,10 131:2 132:3,6,16 133:3,9 133:14,17 134:1 134:24 135:7 137:15,21 138:13 139:17 140:2 142:20 143:2,7,13 143:19 146:20 148:5,16,21 149:12 150:2,5,16 150:23 151:3 153:24 154:8 155:15,19 157:5,9 157:10,17,20,23 158:3,4 159:21 160:8,21,23 164:5 166:6,22 167:6,8 167:15,20,24 168:9,13 169:1,9 169:12,22,23,24 170:4,10,15 171:3 171:24 172:13 173:13,16 174:3,7 174:15,16,20,22 175:2,5,7,15,18,20 175:22 176:18 177:1,4,7,9,12,20 178:8,11,16 179:4 179:8,17,19,23 180:5,7,11,17,19	180:23 181:9,12 181:21 183:6,24 184:2 185:21,23 188:1,23 189:8,11 189:21 191:11,13 192:1 193:2,8,10 193:12 194:1,15 198:10,11,13 199:7,18,22,23 200:16 202:2,7,21 203:4,14,18 204:5 204:7,8,13,20 205:1,8 207:3,11 211:20 212:12 215:5 219:23 223:5 224:1 225:13 226:2,5,23 227:13 228:19 229:4 232:1,6,11 232:17 233:11,19 235:5,8,14 236:7 241:6,7 242:13,17 243:3,11 249:22 252:2,14,21 253:10,23 254:2,2 254:12,24 257:8 260:2 261:21 262:15 263:9 264:19 265:5 267:17,21 272:1,4 272:5,9,16 273:8 273:20 279:10 282:20 283:11 284:9,18 286:7 287:4 290:24 292:7 293:6 294:17,18,23 295:5,15 296:1,3,7 296:20 300:10 309:7 310:16 314:24 322:12	323:8 324:1,24 325:11 334:1 335:12 336:11 338:13 343:10 345:21 346:14,23 346:23 347:22 348:22 349:10 351:8,15 352:7,10 353:18 354:1 356:17 357:6,11 360:13 opportunities 155:16 157:4 158:3 opportunity 23:1 24:4 59:14 63:5 73:22 75:13 77:7 78:13 84:9 86:20 opposed 85:20 91:12 350:19 opposing 86:6 opposite 87:19 351:3 oprs 40:11,24 41:3 order 63:3 67:10 74:7 79:10 80:6 82:24,24 85:7 128:7 146:7 293:6 300:6 313:2 315:19 336:23 345:3 347:20 348:3 364:23 orders 300:8 organizations 168:12,15,19,20 294:5 original 355:23 originally 108:3 121:9,14 originated 114:11
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

oud 70:2 71:10 91:7 119:4,11 159:22 160:10,15 166:5 211:7,14 241:20 242:7,15 243:2,8,8,14 245:18,24 246:5 246:14 248:5,8,17 248:22 249:5,9,14 249:20,22 250:11 251:14,20 311:19 312:8,21 313:12 313:22 314:8,14 315:16 316:19 320:6,7,15 324:7 329:2 331:6 332:19 333:15 outcome 9:3 18:15 18:17 159:7 190:15,21,24 199:1 269:2 outcomes 32:18,23 33:1 159:8 270:19 outlets 158:19 outlined 201:10 outmigration 155:14 outreach 275:10 275:14 276:15 278:18 279:16 outreaches 276:11 outside 267:4 272:14,16 273:12 overall 16:11 47:1 66:2 85:20 108:18 112:16 113:4 120:13 127:16 142:19 144:18 265:7 320:20,23 350:24 354:7,11 364:21	overbroad 54:7 overdose 6:10 124:6 188:9 194:21 197:23,24 198:9,14 199:6 204:12 236:6,7,16 237:3 248:6 252:15 313:11,16 314:2,8,16,23 315:23 316:2 317:23 319:19 320:12,15,24 322:11,18,19 323:9 325:20 326:19 327:8,21 332:2 337:20 343:8 347:3 364:20,21 365:10 overdosed 324:4 335:19 overdoses 183:5 198:16 337:22 overdosing 198:2 overestimate 309:16 overestimating 310:11 overlap 35:22 202:23 203:8 215:10 253:22 overlaps 73:2 254:11 overlooking 288:15 overnight 28:10 overprescribing 293:13,21,22 296:13 overriding 67:9 overstate 293:6	overstated 283:17 oversupplied 294:19 oversupply 108:8 121:20 122:2 123:12 124:12,16 124:17,19,20 139:13 262:15,23 274:23 overtalk 80:13 <p style="text-align: center;">p</p> p 8:1 p.m. 151:18,24 166:13,19 221:2,7 271:10,15 304:22 305:3 307:6,12 369:6,11,24 p1200 2:9 pa 2:21 page 22:14 24:19 26:6 30:17,21 32:7,12,15 34:12 35:3 40:7,8 42:22 45:24 49:4,19 50:15 100:20 104:22,23 105:6 107:10,12 109:6,8 109:8 113:20 118:24 119:1 121:5 122:17 127:15 129:24 130:3 136:24 137:1 139:11,12 140:21 141:1 152:3,3 158:21 159:10 163:4,5,7 163:13 174:2,6,11 183:3 198:18,19 200:12,13 201:14 205:3,4,4,9 206:17 206:18 209:9	211:13,15,18 212:15,17,19,20 212:23,23 213:3 218:22,23 221:15 221:19,20 223:20 225:1 236:3,4,5 241:17,18,24 242:9,10 244:4 258:22,23 259:23 263:19 264:24 265:2 268:18,19 270:12,13,14 271:2 273:18,19 279:20,21 284:15 285:12,14 290:4,5 296:24 298:1,3 306:3 307:22 308:15 312:11,24 314:22 322:6 326:8,11 327:24 334:19,20,21 349:6 360:11 367:7,9,11,16 372:14,16 374:7 375:3 pages 26:4 243:12 paid 15:11,24 16:18 17:10,20 18:1 275:1 pain 5:5,7,11,13 5:20 21:21 22:5 26:9,11,14,16,16 26:21 27:1,13 29:24 30:6,13,16 33:15 38:10 42:24 43:4 45:6,17 46:3 47:1,4,11,23 48:14 48:22 81:7,14 103:14,18 104:8 116:18 126:19,24 127:1 135:1,7
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

141:21 142:4,5,8 142:12,16 143:22 143:24 144:7,9,15 144:18,23 145:3,8 145:14,15,22 146:4,11,16,17,18 146:21 147:1,3,5,8 147:12,21 148:5 148:17 149:5,11 210:6,14 265:4,11 265:14,23 267:14 267:16 284:22 285:1 288:21 291:1,2,11,15,17 291:24 292:13 293:2 295:16 paper 26:8 39:24 42:14 44:24 48:18 49:18,21 50:9 78:16 100:5 103:12 155:9,12 164:2 209:6 210:12 211:24 213:11 218:17 221:10,20 223:21 224:19,23 228:18 230:21 240:17 264:4 289:19 290:1 294:22 312:18,19 313:2 317:11,14,16 318:3,4,6 326:1,4 326:11 328:9 366:11,15,22 368:3,4,16,17 papers 10:22,23 49:24 78:19 119:10 290:15 337:7 paragraph 30:20 31:3 32:15 49:20	100:22 104:4 113:21,24 121:7 152:4 159:12 163:15 165:11 174:11,12 205:5 205:10 206:19 222:11 223:21 225:12 228:22 236:5 242:10 260:3 262:5 263:22,22 264:5,7 264:9,11 268:20 269:19 274:11 275:5,9 276:22 290:5 298:3,13 312:17 parallel 68:10 70:21 71:1 parallels 68:7 parameter 201:8 309:17 310:5,10 310:19 311:5,10 parent 259:9 parental 248:11 parentheticals 314:21 parenthood 259:9 parents 110:18 259:1,5 parse 73:18 part 32:4 56:1 62:22 83:18 84:3 108:2 121:17,18 126:21 151:7 161:10 182:24 184:7 195:14 245:15 274:14 277:20 279:18 292:11 294:5 295:6 312:20 326:13 332:9	337:5 339:4,13 374:9 partial 225:21 partially 290:9 participated 297:11 particular 22:20 59:23 60:1 67:22 69:20 114:8,24 130:21 138:23,24 143:9 149:18 152:15 163:21 178:6 197:9 220:1 233:23 268:9 272:19 274:6 275:9 276:3,17,22 277:8 278:20 283:23 298:20 300:5 307:20 311:5 particularly 156:9 291:2 parties 1:21 8:11 371:12,14 partly 335:2 partner 54:15 81:5,18 161:12 parts 54:21 249:15 250:16 251:6,12 252:9 262:21 party 9:2 62:22 65:3 66:4 pass 301:6,6 passage 76:20 pat 321:21 pathway 114:14 114:16 patient 31:23 285:10,20,21 patient's 291:11	patients 19:16 26:15 33:15 37:12 37:22 38:1,13,20 40:11,24 41:3 46:2 47:11,22 122:24 126:24 127:1 139:1 153:3 280:1 292:19 293:5 pattern 212:24 213:8,14 321:16 patterns 21:5,6,10 217:11 321:6,11 321:14 paul 3:4 54:15 81:5 paulina 2:4 9:15 10:17 28:19 53:15 payment 18:16 payments 18:5 275:12,24 276:23 pdf 367:9 pdmp 230:9 peer 133:8 peers 123:21 pending 91:3 people 30:13,14,16 34:20,23 35:5,14 36:6,16 37:3 38:16,21,23 46:24 47:13 94:8 105:24 106:4,9,10,14 107:7 109:16 119:3,11,13,22 137:14 152:24 155:14 160:21 167:5,20,23 169:7 169:21,23 173:5 173:16 177:10 179:16,23 180:16 181:3,10 184:11
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

185:13 198:7,8 199:1 200:3 203:13 219:22 225:13 226:4,24 227:11,14 228:18 230:3 232:15 233:8 235:7 236:20,24 238:10 238:16,22 239:2,7 240:21 241:20 242:6 243:1,7 244:23 245:5 246:17,22 247:5,7 247:8,8,9,23 248:1 248:3,4,5,7,16,19 248:20 249:23 250:4,7 253:16,20 253:24 254:4,8,21 254:22,23 256:11 256:22 259:9 266:6 271:24 272:3,16 273:3 286:4 287:7,8 294:1,10 298:12 298:12,18,21 320:13 324:3 335:19 364:17,17 366:15 367:23 people's 294:19 295:3 percent 34:14,16 34:19 35:5,9,10 36:5 38:21 46:4,7 104:14 119:4 168:2,24 169:5,6 169:20 173:7 186:4,5,8 199:5,16 199:21 200:19 213:18 214:14 217:13,15,18 219:22 220:8	235:14,17,21 245:5,9,12,18,21 248:15 255:2,13 255:15,17,20 256:2,5,6,7,14 258:18 259:5,19 261:3,7 265:18,18 265:20 267:12,13 267:23 268:1,4,15 270:3,3,14,14 271:21 percentage 33:15 33:21 37:21,24 38:12 40:18 47:1 104:14,19 118:17 158:7,8 170:4,7,13 172:18 173:21 179:1,7 180:22 181:3 192:1 202:1 202:4,5 203:3,5,12 204:21 220:12 236:15 238:4 239:4,7 243:13 245:5,16 253:15 253:19 254:22 255:3 256:10 257:1,14,18 259:12 265:17,21 265:24 309:15 311:6 323:8 342:19,20 348:20 350:4 351:17 352:13,19 353:24 356:8 percentages 186:13 210:23 265:16 percents 255:23 perfect 81:20 perfectly 341:19	perform 340:1 347:20 354:8 366:7 performed 133:21 337:6 340:5,8,12 359:19 360:6 366:4 performing 359:8 period 31:12 128:5 213:1,9 318:3,12,13 320:18 321:17 323:4 330:4 331:8 350:1,24 356:19 365:2,6 periods 47:13 346:4 permit 83:1 permitted 76:3 301:14 302:8 persistent 30:6 person 172:2 189:13 190:2 194:11 260:9 263:10,20 264:11 264:13,14,18,22 272:19 personality 165:19 personally 373:11 374:15 persons 260:5,10 260:13,15,21 261:1 pervasive 139:13 165:3 petkis 3:4 9:13 pharmaceutical 44:16 273:21 274:1,3,7,12,15 275:3,10 276:24	292:7 pharmaceuticals 274:18 pharmacies 19:13 19:15,22 20:2,3 104:7 110:7 111:8 111:13 113:15 114:4,7 116:1,4,8 116:12 122:1,5 139:16 171:4 172:1 177:9 252:19 253:5 279:17 282:16,19 283:2 296:19 300:9 pharmacological 165:19 166:1 pharmacy 19:22 109:17 110:23 111:1,3,19,21,24 112:4,10,22 115:6 115:9,11,17,17,22 119:18,24 123:19 124:2,7 171:11,14 177:17 178:2 253:1,12 296:4,18 phase 236:22 phd 5:4 11:6 phenomenon 178:15 philadelphia 2:21 phone 51:19 52:4 53:16 56:19 58:2 80:20 91:17 98:24 372:3 phones 8:7 phrase 88:1 105:13 106:5 159:1 241:23 306:22 307:20 308:4 348:19
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[physical - position]

Page 44

physical 145:9,20	72:7,22 73:5,24	131:19 134:21	226:11 227:13
physician 109:22	90:20 93:3,6	135:17 137:8	232:15 233:13
130:11 170:1	301:23	152:2,10 155:12	236:19 242:6,15
279:24 293:1	plan 23:18,19,23	155:22 158:23	243:13 245:9,13
physician's 221:24	73:23 301:10	162:2,8,10 163:4	245:13,14 255:4
physicians 118:3	planned 84:16	169:13 174:3,5	255:19,23 256:5
136:10 273:22	303:13 304:7	179:22 183:8	256:14 257:1,15
274:2 275:1,12	planning 71:16	200:3 205:3	257:18 258:2,19
277:2 280:5,6,14	play 23:16 136:23	208:18 211:15	266:3,5,13,15,16
280:22 281:8	player 17:6	216:2,14 217:12	266:17,19 267:4
282:6,10 284:6	please 8:4,6 9:8	218:22,24 219:4,5	267:13,24,24
291:10 293:7	10:1 11:4 13:5	223:20 225:22	268:5,10,15 269:1
pick 8:5 321:22	21:18 28:6 30:18	228:11 235:10,11	270:5,6,17 271:22
picked 96:8	32:13 39:5 40:8	245:3 247:17	285:6 286:1
picking 331:15	42:23 48:9 100:4	275:18 301:21	288:18 311:20
piece 193:15	103:10 104:23	303:11 308:9	312:21 313:17,22
360:20	107:11 121:6	310:13 313:15	314:15 315:8,16
pieces 78:4 87:17	152:3 155:6,12	316:16 333:6	316:19 320:6,8,13
pill 141:14 187:2	198:19 209:11	338:21 342:18	320:15 324:7
pills 105:1,15	210:3 212:15	354:3	329:2 331:7
106:6 108:11,20	217:22 222:22	pointed 73:19	332:19 333:16
108:23 109:17,21	224:10 225:2	174:10 211:17,17	356:7 357:9
109:24 110:6,22	236:4 241:18	pointing 80:21	populations 43:16
110:24 111:2,7,13	247:22 258:23	points 57:4 72:14	85:2 182:20 265:6
112:9 114:7,19,23	265:1 273:19	80:3,6 87:7,10	266:10
115:16,17,21	277:24 278:10,15	206:2	portion 171:23,23
116:4,11 119:17	279:21 289:3	policies 229:2,3	172:5 184:15
126:7 150:9	297:1 298:1	230:23,24 262:13	192:8 212:11
176:13 178:1,3,5	372:12,12	262:16 295:24	215:16 336:12
181:1,4,5 182:3	plenty 62:6	296:5 300:2	343:3,4,6 357:15
252:18 273:8,14	plow 65:13 81:21	policy 300:1	361:3
323:21 324:4,9	plus 171:4	306:19,20	posed 86:16
place 8:7,11 74:9	point 32:14 36:3	poly 163:18 164:3	position 23:23
95:1 101:12	36:16,17 63:13	164:19	24:15 43:15 53:5
122:18 151:2	67:20 70:6,8	polydrug 163:8	53:12 54:2,5
305:12,13 371:6	72:21 93:5 101:12	populated 339:14	56:11 58:20 59:12
places 62:3 308:18	104:3,5 106:10	population 36:23	59:21 72:23 73:6
plaintiff 1:5,12	107:1,12,15,20,24	37:2 102:15,22	73:12 74:1 75:21
plaintiff's 66:15	109:9,10 113:20	143:11 207:24	75:22 76:14 93:6
plaintiffs 2:2 9:16	119:9 121:6	213:24 219:10	93:7,10 98:11
9:22 58:13 68:19	122:15 130:3	220:9,14 222:19	225:8 301:23

304:8	predicate 77:10	134:24 135:7,11	164:5,17 166:22
positions 58:18	prediction 321:12	136:5,10,17,21	167:6,8,15,24
possible 40:19	predictive 351:20	137:11,14,21,23	168:9,13 169:1,9
82:5 112:6 288:19	prefer 196:14	138:23 142:23	169:11,22 170:4
post 229:16	prejudice 303:8	143:1 146:14	170:10,15 171:3
318:14 320:19	prejudiced 74:22	157:11,14 235:14	171:24 172:2,12
322:21 324:13	302:16	260:12 262:14	173:13,16 174:3,7
332:6 352:3,12	prejudicial 74:3	279:22 290:24	174:20,22 175:4
posture 79:6 80:10	75:14 76:14	293:24 294:2	175:15,18,21
potency 174:14	preliminary 69:2	296:16	176:4,7,18,24
325:11 331:11	69:18	prescription 5:10	177:4,7,8,12,15
365:4	prelude 277:20	5:18 6:7,14,20 7:2	178:8,11,16 179:4
potent 237:2 320:9	premise 88:19	7:3 18:24 19:8,12	179:8,16,19,23
324:20 325:6,9	95:17,21	19:16 26:23 27:24	180:1,5,6,11,13,17
365:17	premised 72:10	31:22 33:16,24	180:19,23 181:12
potential 180:20	preparation 15:16	34:1,17,20 35:16	181:14,18,20,21
potentially 117:6	prepare 63:5	35:21 36:2,7,8	183:6,24 184:1,12
190:11 352:6	prepared 49:13	37:5,13,23 38:2	184:13 185:21,23
potentiate 160:12	63:19 64:8 292:4	39:14 40:2 42:6	186:5,19 187:2
252:2,3	300:13	42:17 48:11,20	188:23,24 189:2,8
potentiated 166:8	prescribe 117:7,22	82:16 100:6,11	189:10,11,18,21
194:14	137:18 138:13	101:1 105:9,21,23	190:3,5 191:11,13
pouches 223:13	263:9	106:19 107:16,17	192:1,9,11,14
powell 2:8 9:21	prescribed 43:1	107:21,22 108:1	193:2,8,10,12,24
practice 43:3	50:12 81:12	115:5,7 116:22,23	195:2 197:20,21
81:14 178:10	110:17,21 120:4	117:11,20 118:11	198:3,10,11,13
290:24 296:15	120:11,19,21	118:12 119:13,18	199:7,10,17,23
pradip 210:13	122:24 123:5	119:22,23 120:3	200:8,15 202:2,6
pre 318:14 320:19	153:1,4 203:14	121:1,8 123:5	202:16,21,24
322:21 323:10	222:2 273:13	125:6 126:12	203:4,14,18,24
324:13 332:6	286:7	129:24 130:6,12	204:2,5,7,8,12,13
343:7 345:18,22	prescriber 141:7	130:14,14,18	204:20 205:1,7,12
preceded 229:1	prescribers	131:2,14 132:3,6	206:6,21 207:3,10
precise 56:22 70:8	124:10,10 141:2	132:13,16,22,22	208:1,5 211:20
precisely 348:19	141:18 142:22	133:2,4,14,17,24	212:12 214:19
preclude 82:23	prescribing 5:5	143:2,6 148:21	215:4,12 219:23
274:8,22 277:1	117:10 118:4	149:12 150:16,22	221:24 222:15
279:3 281:7 284:8	119:8 125:24	151:3 152:7,11,17	223:5 224:1,14,21
precluded 75:4	126:13 131:11	153:2,8,18,24	225:13 226:2,4,23
76:22 78:5 79:12	132:1,9 133:24	154:8 155:18	227:12 228:19
303:15	134:10,14,18,20	156:13 157:5	229:1,4 230:1,11

[prescription - proceedings]

Page 46

230:22,24 232:1,6 232:11 233:11,19 235:1,4,7 236:23 238:14 240:13,18 241:2,5,6,12 250:14 251:3,5,8 253:12 254:24 257:8 260:2 261:21 262:1,19 262:22 263:10 264:18 267:20 268:22 269:8 270:2 272:1,4,5,14 272:17,21 273:4,8 273:10,13,16 279:9 283:11 284:17,19,21 285:10,21 287:1,4 287:9,13,14 289:6 289:8,21,22 290:7 290:17 291:10,13 292:13,16,22 293:10,19 295:5 295:15,20 300:10 309:7 310:16 323:18,21,21 324:1 334:1,5 335:8,11 336:7,11 336:13 337:20,23 338:13 343:8,10 345:21 346:7,14 346:23,23 347:5,8 347:13,22 348:4 348:22 351:8,15 351:18,19,22 352:4,7,10,20 353:1,2,4,8,11,13 354:1,2,11 356:3 356:17,18,23 357:5,10,11,12,13 358:10 360:5,12	360:13,21,22 362:18 363:11 364:16,20 365:1,5 365:9,15,16,18 prescriptions 19:17 38:13,18 41:24 104:7,9,14 104:19 115:18 116:17 118:19 119:4,12 125:3 127:21,23 129:4 130:21,23 131:4 131:16 132:18 134:4 141:3 153:4 171:12 203:6 260:4,5,10,13,21 260:24 261:4,15 261:17,20,21 262:7 264:10 294:11 295:2 352:17 prescriptive 137:4 present 3:8 9:4 322:12 325:3 328:19,24 329:16 334:6,9,14,15 335:9,13,17 336:6 336:9,19 338:14 338:15 343:20,23 344:24 345:2 346:9 355:24 357:10,12 365:9 presented 326:10 preserve 303:12 presumably 107:8 124:7 prevalence 35:11 36:15,15,20,21 37:1 38:9 46:15 46:20,21 85:12 119:9 198:20,23	200:1,6,11 211:7 244:10,14,16,17 255:12 268:21 269:8 270:1,23 prevalent 36:1 46:7,9 255:12 prevent 114:18,22 115:4 136:10,17 136:21 137:10,13 137:21 151:2 previous 23:2 57:5 59:10 62:3,12 65:17 69:15 81:5 83:17 84:1,6 86:1 86:2 89:3 97:19 97:22 144:4 162:13 278:7 281:16 302:22 303:3 previously 61:11 61:17 66:24 67:3 72:8,13 73:14,17 73:20 75:12 84:24 89:3 91:23 95:10 96:15 97:3,18 98:2 149:20 290:16 356:7 price 228:1,5 231:5,15 primarily 265:4 276:24 primary 155:17 186:23 187:17 principle 76:4 158:14 161:6 251:23 principles 359:8 print 28:16,22 prior 6:3 22:24 24:2 36:20 43:21 54:24 55:5,23	66:10,10 67:24 69:2 91:22 93:24 96:9,19 101:7 192:9,14 209:14 218:6 221:12 222:2,14 268:1 271:3 272:24 281:18,22 321:23 327:2 344:20,21 346:4,6,6 347:8 351:19 352:24 356:19 prison 266:6,14 private 8:5 privileged 14:21 probability 314:7 324:18 332:1 probably 13:15 36:4 51:9 157:1 181:4 191:3 205:2 235:6 256:2,6 289:14 probe 92:22 93:19 probing 98:1 problem 17:13 56:2 306:12 361:16 problems 90:17 160:20,23 248:10 procedural 93:5 procedure 1:20 65:2 373:5 374:5 proceed 50:23 56:14 63:9 85:23 97:13 222:10 proceeding 9:8 proceedings 51:13 99:12 151:20 166:15 221:4 271:12 303:9 304:24 307:8
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>369:8 process 120:23 produce 166:4 355:19 359:16 produced 64:20 342:15 355:17,22 produces 16:9 344:17 producing 339:3 product 131:17,20 338:2 production 149:21 372:16,17,22 products 19:8 240:22 275:2,13 276:6 277:9,18 proffered 64:12 program 262:19 262:22 programmatic 262:14 programs 136:4 230:1 297:3,6,22 297:22 progress 205:8 211:20 212:5,5,12 progressed 215:5 progression 215:14,18 216:19 216:23 prohibition 92:17 projecting 361:12 projection 363:19 364:7 365:11 projections 365:12 promise 287:19 promoted 284:3 promoting 276:9 promotional 273:21 274:2,12 279:13,16</p>	<p>prompt 56:20 promptly 56:13 proof 75:18 proper 43:12 58:16 62:7 property 166:1 proportion 167:23 169:7 184:11 192:19,20 198:24 199:8 205:7 211:19 212:5 214:16 215:4 238:7 248:7 proportionate 345:21 proposing 341:14 341:18 prospective 6:6 40:12 100:5,10 124:6 223:4 protocol 301:10 301:14 341:11 provide 16:9 38:2 44:19 65:2 201:7 203:21 308:19 309:3 340:15 356:12 362:8,10 362:10 provided 63:24 64:1 68:11 350:24 355:9 362:9 363:15 provider 180:2 providers 119:7 141:14 172:3 providing 20:23 61:15 68:5 70:22 341:11 proving 68:20 72:5</p>	<p>provisional 243:22 proxy 252:17 psychiatric 159:17 165:20 psychoactive 6:2 159:15 209:14 218:5 221:11 222:1 public 6:15 37:19 39:15 40:2 61:23 136:4 371:4 373:10,18 374:15 374:23 375:23 published 40:17 40:19 91:21 135:22 136:4 140:19,24 143:24 168:4 192:24 240:17 260:18 317:14 pull 11:3 21:17 209:22 210:2 287:16 pulled 17:17 25:11 81:18 purity 231:5 purporting 55:10 purpose 116:22 117:8,10,12 309:4 331:23 371:6 purposes 11:8 13:10 20:15,23 21:24 26:2 39:18 42:10 48:16 53:13 61:3 100:15 103:22 135:2 209:19 210:10 218:14 224:16 247:4 288:6 289:10 325:23 333:15 334:6,12</p>	<p>335:9 344:21 345:12 346:15 347:1 354:19 360:4 pursuant 1:20 35:20 41:24 106:19 154:9 pursue 299:8 302:11,13 put 57:13 73:8,11 73:12 74:2 79:6 80:10 81:24 83:9 98:16,17 102:9 105:19 249:3 256:9 268:14 331:15 335:24 337:13 338:3 341:21 342:16 363:21 puts 76:13 putting 58:4 202:12 203:22</p>
q			
<p>qualified 371:5 qualify 45:3 207:17 quality 66:12 quantities 121:10 129:23 130:2,10 139:17 quantity 66:13 130:6,15,21 140:2 quarter 173:2 quarters 267:2,9 312:16 question 16:16,17 16:21 22:17 23:1 23:3 24:24 29:6 30:12 61:21 69:2 69:19 75:8 79:7 81:2,4,9 82:14</p>			

85:4,8,18,21 87:22 88:18 91:9,20 93:15 96:11 97:24 98:10 101:6,9,10 101:12 102:13 110:2,2 124:18 125:20 126:2 129:20 131:13 133:1 136:14 151:13 153:22 157:1 162:12,17 167:11,13 170:3 170:17 178:19 180:8 189:9 199:21 203:11 207:2 208:1 213:22 214:18 215:1 216:8 220:11 227:8,18 227:20,21,24 238:3 277:3,5,21 278:7,17 288:8 294:7 307:1,18 310:4,20,22 314:11 321:15 325:4,12,15 327:12,12 330:7 330:13,19,19 331:1,10,21 333:2 333:3,7,9,11 335:2 335:4,6,15,24 338:1 339:20 343:17,22 344:21 345:9,23 352:23 354:18 355:23 356:2,10 358:3 362:17 364:8,14 364:23 365:14 questioned 97:19 149:20	questioning 23:1 43:21 49:7 61:10 61:13 69:1 79:2 84:17 85:23 87:5 95:13,16 161:7,9 281:18,22 305:11 339:18 questions 16:24 18:20 23:19 49:4 49:7,16 50:19 53:18 59:15 60:7 60:22 61:9 62:21 70:12 71:8,10,14 71:20 78:3 79:10 79:11,15,16,22 80:7 82:4,9,23 83:2 84:16 85:14 87:9,21 92:13,18 94:11,16,18,19 95:2 96:16,22 97:21 98:2 147:23 161:14 162:6,21 178:21,23 183:20 205:23,24 215:22 281:14 303:1 305:19 333:22 334:13 340:24 341:9 342:3,5 347:23 369:14,16 369:23 quick 271:7 quickly 91:21 271:17 quite 11:12 35:1 43:14 65:18 76:12 240:19 248:12 306:9 319:6 348:11 quotas 149:21 150:1,6,11,12 295:5	quote 73:10 81:17 121:13 307:16 309:3 310:6 quotes 96:8 r r 2:14 8:1 10:3 raised 63:3,10,12 64:7 69:1 81:4 84:23 304:2 raising 338:7 368:2 random 80:13 325:13 randomly 233:8 range 19:7 25:9,16 29:18 46:4 60:22 138:18 173:10 217:12,17 248:2 255:20 325:8 355:4 ranged 198:20 ranking 328:11 ranks 328:12 rare 225:14 226:5 228:20 rate 15:8,10,13,14 16:10 214:2,21 225:15 226:7,14 226:20 229:5 246:1,5,14,15 251:14 260:9,9,24 263:9 285:9,15 287:6,7,12 288:17 291:9 313:11,11 314:2,6,23 315:23 316:2 317:23 320:21,24 322:11 322:19 328:16 329:6 332:3 337:20 349:9,10 349:15,20 350:13	350:13 351:5,14 351:15 355:24 356:1 359:22,24 360:4,7,11,16 rates 5:13 21:20 22:4 70:2 71:10 140:24 228:24 231:7 284:17 295:19 319:19 320:22 359:20 360:1,8,10 ratio 337:16,18,18 348:5 352:22 353:19 356:11 rationale 137:2 ratios 337:12 raymond 2:15 reach 50:18 51:2 52:6,17 56:17 57:1 115:18 275:22 276:2 277:7,12,16 278:23 279:8 reached 52:9 82:19 reaching 275:19 reactivity 165:19 read 16:24 33:19 46:6 54:18 81:15 219:14 225:22,24 232:8 283:5,6 294:6 298:11,11 307:15 308:7 341:10 370:5 371:10 373:5,6,12 374:5,6,17 readily 36:4 319:9 reading 225:21 306:16 372:20 reads 32:16 43:1 228:23
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

ready 63:18	366:21 367:1,5,24	304:17,20,21	135:18,21 136:6
real 13:19 160:16	368:2,20	305:3 307:4,5,7,12	153:15 155:14
really 16:14 54:3	receipt 372:19	341:5 364:4 369:2	157:19 158:23
55:14 74:2 78:22	receive 18:16	369:5,11,23 374:9	164:13 165:10,16
134:6 144:24	114:19,23 169:8	recorded 8:13	165:17 168:23
146:24 163:6	173:6 179:16	recording 8:10	174:19 208:20
216:1 235:22	received 14:3 36:8	recovering 248:6	209:3 219:13
277:23 310:3	123:18 180:16	recruited 206:20	263:20 275:8
315:19 331:15	receiving 119:13	red 80:2	280:5 286:3
339:15 361:5	124:9	redeposed 62:23	292:18 293:1,12
realm 122:8	recess 99:11	redemption 76:15	308:5,16 314:20
realtime 17:14	166:14 221:3	redistribution	315:13 317:22
33:18 305:20	271:11 304:23	293:14	326:5 327:7 328:1
306:2 307:22	369:7	reduce 262:13,15	328:2 366:10
308:16 309:20	recklessly 119:8	331:6	372:8 373:2 374:2
reason 63:23 94:1	recognition	reduced 231:5,15	referenced 368:18
153:6 180:10,15	146:13	371:10	373:11 374:15
220:6 251:10	recognize 11:13	reducing 232:2	references 85:1
267:8 268:8 285:3	93:3	262:23	referred 81:1
288:16 303:8	recognizes 236:22	reduction 261:3	126:11 129:16
331:2,7 338:8	recollection	262:6	141:14 154:12
372:15 374:8	367:20	reductions 264:22	274:17 324:21
375:3	recommendations	redundant 23:5	referring 12:20
reasonable 205:10	136:16 137:3,10	reed 2:20 9:18	31:4 57:4 105:3
214:11,23 229:18	recommended	reexamination	105:22 106:6,23
248:17 306:5,22	134:20 137:22,24	96:7	107:2 122:21
307:23 308:4,12	reconfirmed 335:8	refer 49:21 108:13	126:15 130:9
309:9 312:1,3,6	record 8:3,12 9:6	113:21 121:7	135:10,19 141:1
357:8 365:24	14:12 22:2 39:24	129:23,24 139:13	152:21 153:11
reasoning 88:23	42:14 48:18 51:10	140:22 153:16	156:2 207:1 213:5
180:10	51:12,17 57:13,19	156:1,3,7 158:21	229:21 242:1
reasons 96:14	57:20,23 75:22	159:10 174:2,6	266:16 274:24
225:14 226:5,20	99:9,15 100:4	198:20 206:18,19	275:12 279:15
228:19	103:12 151:15,17	208:9 265:21	290:15 334:23
recall 174:6	151:19,24 166:11	266:20 270:4	337:2,5 340:14
305:20,24 306:8	166:12,19 210:12	274:15 290:13	349:7
308:2,21 328:3,6	216:21 218:16	294:1 298:3	refers 31:21 122:7
328:14 339:3,6,12	221:1,7 223:12	334:17 366:11	159:4 163:18
349:15,15 360:15	224:19 271:9,15	reference 31:6,7	164:24 199:8
360:20,24 363:20	276:20 301:19	32:1,5,8 79:18	274:6
364:1 366:12,19	302:20 304:11,14	96:22 105:8	

reflect 34:12 46:1 199:21 203:23 212:3 264:18 269:22 322:7 reflected 15:4 44:14 136:22,24 254:21,22 306:2 310:24 328:9 reflecting 46:21 145:2 261:19,19 reflection 18:3 reflects 18:3 127:17 137:8 199:14,16 214:12 214:20 216:18 217:1 260:20 261:20 263:13,14 265:16 339:2 refresh 367:20 regard 62:21 86:15 275:13 276:5 284:7 296:23 300:1 310:13,16,18,23 regarding 125:24 regardless 114:10 280:12 regards 72:1 86:23 95:9 registered 1:21 regular 219:2 258:13 regulations 299:22 regulators 150:22 rehash 69:24 83:15 88:20 rehashed 67:14 rehashing 66:6 84:5 reinquiry 84:5	reiterate 72:22 reiteration 74:17 rejected 318:24 relate 23:20 68:2,3 68:10 70:14 77:9 85:11,12 303:5 333:23 347:23 related 9:2 32:17 92:14 109:11 112:15 158:22 206:5 229:4 249:12 257:3 281:6 282:12 283:21 284:1 294:9,13 295:18 301:2 303:13 371:12 relates 70:23 relating 63:11 92:20 relation 20:8 53:7 67:22 78:8 93:23 94:4 113:14 276:9 298:20 302:16 relationship 5:18 33:3 105:9 120:24 205:11 206:23 224:13,21 241:9 241:11 358:22,23 relative 123:19 315:8 371:13 relatively 125:24 229:6 239:19 354:3 released 44:16 177:16 243:23 relevance 359:14 relevant 156:9 163:22 197:9 204:16,18 253:4 318:3,12,18,20	320:7,13 329:2,17 329:21,22,24 330:10 332:19 reliability 183:1 365:22 366:3 reliable 190:6 201:1 309:21 311:7 312:2,3,6 320:18 321:2 332:5,14 338:8 350:2,3,8,20,24 365:24 reliably 193:5 reliance 25:17 97:14 relied 61:1 84:21 201:9 240:7 246:18 254:16 relief 27:13 284:23 reliever 5:21 210:7,14 265:4,11 265:14,23 267:14 267:16 relievers 104:8 rely 12:19 25:22 27:11 126:1 230:5 244:7 355:8 relying 12:1,6,13 13:2 44:9 122:12 123:9 247:15 354:13,19 355:1 remained 316:17 remains 269:4 remedial 72:1 remember 149:21 367:22 remotely 1:21 8:21 9:5 rendering 92:24 repeat 24:24 64:4 102:13 162:17	307:1 repeating 162:21 215:21 rephrase 136:13 333:9 reploving 49:5 report 5:3 6:18 11:6,16,20,23 12:3 12:7,9,15,18 13:8 14:3,10,14,24 15:4 22:10,11,14,15 23:10,11,20 24:19 25:2 26:3,5 27:12 30:18 32:5,7,13,16 35:9 40:19,22 41:4,10 44:7 45:24 47:18,20 49:8,10,11,13,14 49:19 50:8 53:19 53:22,22 54:3,7,8 54:10,14,20,22 55:9 56:8 59:23 59:24 60:3,11,14 60:20 61:14,24 62:9 63:24 64:10 64:19 65:17 66:22 69:9 73:8,16 76:11,20,21 85:1 89:9,12 94:16 95:16,17,22 104:23,23 107:11 108:14 109:9 110:12 112:15 113:3,10,20 114:13 116:10 118:20 121:5 122:16 126:17 129:24 135:16,24 139:11 144:7 148:8 151:10 152:3 154:16
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[report - right]

Page 51

158:21 159:10 163:7,16 167:19 169:8 173:5 174:2 174:9 183:4,9 198:18 200:12 201:10 211:5,9,16 212:3 215:3 216:16,23 217:1 219:24 226:2 228:8 230:6 232:5 236:4 240:7 241:18,19 242:1 244:5 246:19,20 246:23 258:23 259:24 262:20 265:1,17,17 268:16,19 269:13 270:15 272:16 273:19 274:10 279:5,21 280:21 284:16 297:1 298:18,19 302:1,2 302:9 303:14 309:5 311:11 312:12 317:22 334:18 335:1 344:11 349:6 350:12 355:9,20 360:11 367:8,9,13 reported 150:15 150:21 220:6 264:5 267:13 268:1 reporter 1:21 8:23 10:1 57:22 306:23 373:7 reporting 270:16 reports 25:16 34:11 60:12 62:3 73:1,2 148:10 175:6 247:2,3	282:18,23 283:6,8 302:10 303:15 represent 172:22 305:7 representation 188:9 represented 348:21 362:1 represents 347:6 request 101:20 371:10 374:9,11 requested 341:23 require 313:8 required 65:10 188:20 372:24 requirements 371:15 requires 87:5 301:10 research 340:3 resemble 323:21 residents 259:7 resolution 58:19 resolve 90:18 91:21 resource 328:4 respect 14:10 63:16,20 71:4 76:24 82:18 86:6 92:24 300:14 320:4 330:17 365:21 respond 61:20 responding 84:13 216:10 response 33:3 rest 51:9 164:2 180:9 228:9 230:16 251:14 337:22	restricting 230:2 restrictive 92:11 result 182:6 233:2 237:3 238:1 313:23 315:15,16 328:17 336:17 338:17,18 351:22 353:13 354:1 365:10 resulted 91:7 338:22 results 102:8 103:3 219:12 220:6,8 221:22 352:11 354:4,22 355:6 resume 99:7 retail 104:6 retain 355:12,14 retained 63:14 64:12 76:18 370:2 return 56:19 returned 372:19 review 5:14 14:23 21:22 22:5 25:18 26:3,5,6,11 29:7 110:12 134:15 140:6,14 144:19 145:23 146:7 184:5 240:14 250:17 322:5 328:10 340:4 372:13 373:1 374:1 reviewed 12:14 25:21 116:9,14 127:9 140:13 143:23 148:7,8,12 148:19 206:8 207:4 281:5 284:12 297:24	299:24 300:8,12 301:1 reviewing 297:8 reviews 41:12 229:24 revoking 296:12 296:18 rich 292:8 294:22 right 10:11 11:12 17:8,18 18:13,24 19:4,17,18 23:8 24:6,7 25:13,23 26:4,8,15 29:8,12 29:17 33:8,16 34:17 35:6,17,21 36:17 49:22 50:3 50:13 51:8 52:20 56:15 63:17 83:10 106:12,20 108:12 109:14,18 110:7 111:14 112:5 113:11,18 114:4 114:15 115:19,22 122:17 123:7,8 127:18 128:22 130:6,22 131:8 132:19 133:5 137:1 139:18,18 143:2 153:18 154:24 156:10 159:12,16 160:10 164:24 166:6 173:13,17 174:17 176:13 179:3 182:2,11 183:7,11 184:3,4,6,24 185:12,15,19 186:2,6,20,23 188:6 189:5,6,22 191:1,13 193:9,22 194:1 195:4,9,15
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[right - says]

Page 52

196:19 199:12 201:18,22,22 202:2 209:10 210:4 215:5,8,19 217:23 218:24 220:10 223:16 226:19 227:4,19 230:16 232:7 233:8 234:15 237:16 238:17 239:20 241:21 242:7,8 243:18 244:5,8,12 245:2,4 245:4,11,17 246:3 246:11 249:7 253:17 254:6,7,24 256:24 260:16,16 260:22,23 261:1,6 261:7,8,10,15,22 261:23 264:20 267:15 268:3,6 269:3,5,14 270:10 271:4,5 272:1,6 273:10,17 274:4 274:19 277:4 280:7 284:17 285:11,18,19,22 285:23 286:16 292:12 298:14,24 299:4 304:17 307:1 312:23 315:10,11,14 316:21,24 317:7 317:12,13,15 318:1 321:8 326:7 326:9,12,16,24 329:12 330:5,6 334:10 335:21 337:21 338:16 339:10,16 343:16 344:8 346:17	347:14,15,18,18 348:8,11 349:8 351:12,13 359:9 360:3 362:11 rights 342:5 rigor 126:3 129:2 rise 172:9,15 risk 106:15 124:5 159:4,5,9,11,21 160:17,20,22,24 161:10,19 162:12 162:15 164:1,16 164:20 166:9 181:15 182:1 194:15 198:5 234:11 250:5 252:1 266:2,10 280:1 357:20,20 risks 32:17,22 33:6 137:17 138:1 138:6,11,17 143:6 143:13,18 146:14 149:1,15 276:3,16 277:8,17 278:19 278:24 279:9 280:11,15 283:10 283:17 284:1 rmr 371:20 robust 354:5 robustness 354:14 355:5,10,14 role 5:9 48:11,20 138:15 room 9:4 10:14,16 10:20 79:1 roughly 15:23 16:2 routes 295:2 routine 304:12 357:19,22 358:1	routinely 193:5 305:17 355:4,20 356:9 366:7 row 339:12 362:2 364:5 rows 339:9 rpr 371:20 ruby 2:14,15 62:18,19 64:3,5 72:21 73:19 80:17 80:19,21 81:23,23 83:3,5,8 84:11 86:5 92:6,8 95:7 97:8 98:21 rule 22:18 43:21 54:17,18 58:20 59:18 65:5 71:5 84:15 87:20 88:5 89:24 302:23 343:19,24 344:10 345:2 ruled 303:18 rules 1:20 17:6 22:22 58:24 65:2 373:5 374:5 ruling 67:1,21 68:14 82:22 86:4 90:7 92:9 93:15 97:14 302:4,15,23 303:6,20 rulings 302:22 run 246:10 rural 6:19 42:5,16 43:16 78:17,22 81:2,17 86:12,18 155:11,16 156:8,9 156:13,15,18 157:3,24 163:9,20 163:21 366:16	s s 1:21 2:15 8:1 10:3 60:1 371:4 371:20 372:16 374:8,8 375:3 safety 6:12 288:3 saith 370:6 sample 265:24 268:17 samples 206:20 sampling 266:22 267:11 268:12 270:11 sanctioned 293:15 save 239:15 saves 239:18 saving 239:14 saw 16:8 135:10 135:18 156:18 307:17 saying 46:20 75:3 82:1 87:3 88:10 88:16 89:22 95:8 97:11,13,16 122:5 124:11 158:10 171:10 172:11 178:4 186:8 188:16 190:4 207:18 211:6 242:24 256:19 265:21 266:13 267:12 286:13 287:3 329:17,18 says 13:12 30:22 40:9 43:22 49:8 50:21 75:6 77:23 78:5 80:11 91:14 93:18 96:14 104:6 137:3 155:15 205:6 219:1,14 221:21 222:12
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[says - set]

Page 53

223:22 225:12 269:1 290:5 328:4 341:16 scales 273:6 scenario 168:19 181:21,23 188:17 schmidt 3:4 54:16 81:5 school 139:5,8 247:8 schools 136:3 248:9 scope 49:16 58:16 87:3 272:17 scratch 88:6 seal 373:15 374:21 sean 100:5 search 88:6 second 43:7 44:2 119:6 151:16 152:4 159:11 181:24 205:5 206:19 218:23 219:1 221:20 222:13 223:21 367:6 secondary 186:23 187:17 section 118:20,23 123:16,21 124:8 174:8 213:13,13 230:9 274:14 275:21 309:5,10 311:10 334:17 sectional 206:20 207:5,8 sections 54:9 274:24 298:18 see 14:24 23:4 30:4 31:1 32:20 40:14 43:5,12	47:18,19 50:7,8 51:1 52:1,16 58:18 63:22,22 69:17 86:3 101:4 101:15 104:11 105:10 107:18 109:14 113:23 121:12 122:17 130:2 136:24 137:6,7 139:15,21 141:1 149:3 152:8 155:10,20 163:11 163:16,17 164:3 167:23 169:10 188:20 189:2 191:19 198:21 200:16 205:13 206:23 208:9 211:22 212:8 213:12,13,20 218:22 219:6,15 222:4,16,23 224:3 225:16 226:8,18 229:7 231:8 233:24 235:12 236:8,12 242:13 242:19,23 252:17 254:21 256:20 259:1 260:6,11 263:21 264:12 265:8,18 268:24 273:23 280:2 285:15 287:17,20 287:20,24 288:12 290:11 291:3,5,12 291:17,19 292:14 292:18 293:1,9,15 293:17 301:11 306:12,21 311:12 326:19 336:8 340:13 341:23	359:14 361:5 362:6,21 363:6 367:18 seeing 16:7 209:3 248:14 342:6 seek 196:7,10 seeking 6:4 59:19 60:15 61:3 66:19 81:9 165:20 195:21 209:17 seen 12:23,23 16:23 17:1 40:4 48:23 54:10 100:17 103:24 127:10 129:6 145:2,5,10,16,21 147:11 151:5 156:19 170:8 179:14 186:11 214:12,24 216:18 216:24 217:1 218:19 221:16 224:22 227:6 228:4 240:6 253:4 264:16,21 283:19 283:24 284:5,10 296:14 341:16 select 321:18 self 42:24 sell 19:13 selling 115:15,15 156:4,4 send 208:23 209:6 341:24 342:2 sensation 165:20 sense 29:11 61:8 188:15 246:11,14 249:13 316:10 sensitive 8:5 sensitivity 291:11 293:2 354:8 355:5	355:15,21,22 sent 10:19 13:24 28:10,13 289:13 289:15 340:17 sentence 30:21 32:16 40:9 43:1 44:13,14,17,18,20 45:2 62:10 81:7 81:11,15 101:4,15 102:11 105:3,6 107:14 109:9 139:13 155:13 205:6 211:17 212:10 213:16 215:7 219:1 225:21,23 228:7 228:23 231:3 242:18 243:4 265:2,20 269:6 274:6,10 sentences 104:6 137:3 separate 60:14 118:7 159:20,24 303:16 359:23 september 1:21 8:3 371:17 372:4 sequence 84:17 152:20,23 192:15 series 82:9 332:7 332:10 served 19:20,23 services 243:8 247:10 set 11:20,23 26:2 68:11 87:15 128:24 135:12 136:16 150:1,6 162:6 182:10 226:23 227:13,15 371:15
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[setting - sorry]

Page 54

setting 10:11 33:6 84:7 87:4 162:1 seven 51:4 66:8 94:23 371:15,15 severe 34:13 35:4 35:15,18 shadows 305:11 share 167:15 169:11 342:20 343:7,9,11 345:17 345:21 347:3 348:3 351:17,20 352:20 356:16,18 356:20 360:12 shares 20:6 21:4,8 sharing 114:18,23 133:12 sharply 219:3 sheet 6:18 13:8 244:1 271:18 372:14 374:7,10 374:18 375:1 shift 290:23 shipment 253:4 shipments 112:18 112:20 113:8,15 114:9 120:13 252:13,17 253:5 shipped 111:7 120:2,10,14,18,20 252:18 253:10 ships 112:9 shopping 292:19 short 104:9,15,20 331:20 shorthand 371:9 shortly 52:12 show 29:3 35:9 203:17 240:12 268:21 287:12 325:10 341:3	364:12 showed 124:4 270:12,13 showing 245:18 shown 245:5 372:16 shows 125:15 245:8 260:21,24 267:23 269:14 shutting 296:12 side 16:9,22 95:6 134:6 sides 16:8,23 98:11,14 sift 73:13 76:9 sign 147:13 291:16 signals 206:22 signature 371:19 372:15 signed 54:8 373:13 374:18 significant 152:6 154:6 166:22 167:12 187:9 205:6 211:19 212:4,11 222:1 233:10 signing 372:20 silvia 289:19 similar 66:11 141:9 220:2 259:17 310:8 323:9 352:11 simple 80:2 216:14 simplistic 263:16 345:24 simply 79:13 82:5 87:13 92:18 308:6 345:10 368:20	simulate 201:9 simulation 193:4 201:3 259:15 309:11,22 simultaneously 223:24 sincerely 372:21 single 204:3 338:18 sir 372:10 sit 63:17 328:3,7 345:10 368:6,15 sitting 99:5 295:2 328:6 situation 62:21 74:3 92:15 situations 63:21 64:15 82:2 six 30:24 81:18,19 285:13 315:14,22 315:23 316:6,7,8 316:18 326:22 328:8 slightly 214:1,4 217:9 365:3 slow 296:12,18 361:13 slowly 361:15 small 179:12 181:3 202:9 203:19 205:6 211:19 212:4,10 213:13 318:15 smaller 20:3 239:20 313:17,22 314:14 315:7,16 316:20,24 smith 2:8,20 9:18 9:21,21 smoked 198:8	smoking 198:6 social 133:11 194:8 195:8 233:14 234:13 249:4,12 251:19 sold 115:21 116:12 323:12 sole 107:5 190:10 191:23 solely 26:9 181:8 203:14 204:4 353:17 solomon 6:13 288:5 solutions 372:1 375:1 solve 56:1 somebody 80:15 80:17,22 110:21 169:16 175:11 181:13,20 185:10 186:3 189:18 192:13 194:7,18 198:1 202:15 somebody's 275:18 somewhat 72:10 217:10 226:17 267:7 sorry 11:11 14:2 18:12 24:23,23 28:10,18,19 31:10 31:16 33:18 46:19 53:24 58:13 64:3 102:4,12,18 109:6 109:6 110:1 120:16 121:3 122:11 128:18 135:13,20 141:12 142:3,15 160:5 161:4 163:12
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[sorry - stand]

Page 55

165:5 169:3 174:10 179:1 187:7 189:21 193:12 199:15 201:16,20,22 207:17 209:1 210:1,1,3 212:16 229:13 230:7,11 232:8,24 242:20 242:23 245:6 253:15 258:8 260:9 273:11 277:4 278:5 285:12 289:14 294:6 306:23 314:17 319:15 321:15 322:8 323:18 328:14 334:19 337:18 347:9,16 348:10 348:12 351:4,16 353:9 361:14 362:20 363:5 sort 113:23 160:1 237:8 352:3 sought 22:22 59:1 sound 80:14 230:16 256:9 310:2 source 25:2,3,5 104:4 110:8,13 122:2 123:20,22 124:2,17 126:14 131:5,15 139:2,4,6 155:18 158:9 180:20 254:6,10 276:22 306:13 sourced 169:2 170:5 sources 25:6 108:17 110:3,9	113:4,14 115:14 119:2,7 124:7 125:3 126:17 131:8,10,12,13,16 132:14 133:6 157:15 167:22 171:6,8 172:1,12 172:22 175:1 179:21 180:9 317:3,6 322:6 southern 1:1 8:17 sparse 229:6 speak 40:18 41:12 97:12 148:20 167:18 319:12 speaker 58:4 speaking 35:7 39:3 86:7 162:9 277:23 305:22 326:2 speaks 41:6 154:18 special 58:6 62:15 64:2,24 65:20,24 68:15 71:18 72:17 74:5 77:4,15,17 78:10 79:21 83:7 86:9 87:24 90:11 91:19 92:2,7 94:17 96:24 98:5 98:22 161:17,24 281:16 302:20 303:6 specific 12:5,6 19:24 61:20 64:13 65:18 68:21 69:11 70:4 71:22 72:18 74:8 75:1,17 78:4 78:8,15 79:4,11,16 80:7 82:4 83:1 84:21 85:6,9,15,19	87:7,17 88:12 89:7,8 90:17,24 91:5 93:12,13 94:13,14 95:3 97:21,23,24 98:1,8 105:3 110:13 111:10 112:17,17 113:8 120:12 122:7 130:8,8 139:23 140:2 141:15 142:21 144:14,20 145:21 147:23 149:2 156:14 162:6 164:8 168:10 199:3 206:5,8,12 206:13 208:8 210:22 215:1 227:7 228:5 231:1 257:9,21 275:23 276:11 288:13 295:18,19 300:21 301:1 306:20 310:3,5 325:14 328:4 337:1 340:10,11,11 341:1 360:7,16,17 364:22 specifically 12:2,8 20:9 24:1 40:21 54:17 64:20 65:4 69:22 70:14,23 72:3 89:17,18 90:3 121:1 126:4 130:9 131:23,24 142:8 144:9 168:18 207:14,23 207:24 214:17 217:3 235:19 263:5 275:1 276:21 280:20,23	297:20 308:15 309:1,19 310:18 313:6 314:22 325:4 340:14 346:15 352:14 356:21 365:1,9,18 specificity 108:15 specifics 175:23 225:4 276:7 367:24 specified 371:6 specify 280:8 speculate 258:20 spend 13:15 23:8 spike 187:9 234:20 234:22 spoke 29:15,22 228:6 234:9 246:17,22 247:5,7 247:7,8,9 248:1 298:12,15,19,21 367:20 368:1 spoken 367:3 spread 109:12 spreadsheet 340:11,19,21 345:5,9 348:12 360:18 361:6 362:6 square 2:20 stabilization 219:15 stabilizing 268:22 269:9 stack 155:8 stage 10:11 226:24 227:13,15 stake 18:14 stand 44:12,17 53:21 302:2 368:19
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

standard 43:3 61:6 76:13 81:13 143:22 144:23 146:4,10 147:2,20 149:2,10,18 standards 137:5 148:22 standing 55:3 56:12 staring 364:11 start 219:23 223:21 242:21 301:18 started 219:2 starting 304:15 347:19 starts 152:4 205:2 242:22 state 9:5,8 19:3 58:18 68:14 75:21 145:9,14 148:4,9 150:21 244:23 246:7 248:23 250:16 251:7,12 251:15 252:10 263:3,6,8 264:1,5 278:1,1,9 285:9 292:12 301:18 302:6,19 371:1,4 373:10 374:15 stated 12:7 40:22 60:16 71:5,6 96:15 102:10,14 103:1 205:15,19 211:9,12 219:24 222:7 226:10,14 228:12 232:4 304:9 statement 27:4 28:2 45:3,13,21 100:22 101:22	102:1,3,6 103:4,6 108:5 111:5 114:21 115:3 116:20 118:2,16 119:21 120:6,7,8 127:20 137:2 138:21 156:12 196:4 212:1 216:15 225:2 228:17 231:2 265:10 269:12 280:11 306:20 355:2 358:18,21 359:3,6 373:13,14 374:19,19 statements 148:3 148:11,15,23 285:5 states 1:1 5:6,22 6:21 8:17 42:8,18 58:22 131:18 135:1,8 210:8,15 217:13 245:21 257:11 258:14 328:12,13 statewide 264:19 359:18 stating 11:19,22 76:2 199:4 205:19 statistic 286:16 351:20 statistical 196:24 357:23 358:7,15 366:4,8 statistically 152:5 154:6 350:2,3 statistics 184:20 285:24 318:6 status 57:6 stayed 57:18,20 365:6	stays 353:23 step 348:5,19 349:1 stephen 3:4 9:13 steve 62:19 81:23 86:8 93:21 steven 2:14 stick 321:22 sticking 319:8 360:19 stop 50:17 51:1 95:14 362:24 stopped 318:7,11 stores 158:11 straight 238:11,23 strategies 5:8 103:15,20 street 2:6,9,13,16 2:21 3:6 158:11 streets 323:13 stress 165:13 stressful 250:9 stressors 164:24 165:3,7 strike 31:11 43:10 120:17 121:3,4 128:19 156:6 157:2 245:7 strong 152:5 154:6 206:22 239:22 253:22 stronger 196:14 239:16 structural 165:2,5 248:21,23 249:2 stuck 331:3 students 123:23 studied 20:15 21:6 156:21 164:17 314:14	studies 12:2,5 25:20,21,24 26:10 28:13 29:7,23 31:13 32:3,6 33:23 34:7 40:12 40:17 41:9 47:7,8 47:12 48:3,5 59:13,16,20 60:1 63:23 64:11,18 85:2,2 86:24 93:8 122:13,21 123:2 123:10,23 127:12 134:14 139:23 140:3 145:2,16 153:14 154:13 164:7 167:20 169:8 173:4 179:11,14 206:8 206:20 207:1,4,5,9 207:13,18,19 214:20 215:1 216:22 228:24 229:23 230:5,9,10 230:19,23 231:1 239:23 240:3,12 240:14 243:6,9 254:17 259:10 274:14 297:8,11 297:14 368:13 study 6:6 21:3,7,9 22:24 24:18 25:3 25:8,9,16 26:17 29:16 30:23 31:5 31:13 34:8 36:17 37:20,21 38:16 41:1,5,6,13,16 43:13,16 46:23 47:11 50:11 54:12 54:12,13,23 60:2 85:6,10,11,12 91:4 91:5,11,21 92:1
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

93:17 99:19,24 100:6,10,17 101:7 102:7 123:15 124:3 125:20 140:9 153:13 154:11 164:15 170:8 192:23 206:5,13 208:7,9 208:14,15 210:18 210:21 214:12,13 216:18 218:19 221:17,22 223:4 241:3,10,14,16 243:5,5 270:9 287:16,18 288:11 290:6 297:16 305:21,24 307:18 307:19 366:11 368:9,11,22,23 studying 215:18 297:5 stuff 55:20 66:6 sub 206:19 subgroup 199:1 356:20,23 357:20 subject 22:24 24:2 43:21 54:23 55:5 55:23 56:5 59:10 61:10 62:5 67:23 76:15 77:5 78:5 79:8,10 80:12 83:16 87:5 89:3 96:9,19 228:11 258:12 281:12 303:2,3 subjected 90:9 subjects 59:15 65:16 67:13 70:20 182:7 submit 69:7 77:1	submits 55:9 submitted 11:16 12:10,14,22 14:9 14:14 23:9,12,21 24:20 44:7 49:15 53:19,22 54:7,20 59:22 60:10,12 62:9 64:10 66:22 73:1,2,14 300:9 303:15 submitting 12:18 subpart 113:21 subscribed 373:10 374:14 375:21 subsequent 6:8 95:16 100:12 305:23 331:14 333:12,18 subset 34:19 35:1 substance 6:2 87:22 88:4 96:18 100:7 159:18 209:14 218:6 221:11 255:3,5,19 256:3,8,14 257:2 257:15,19 258:1 258:16 266:8,14 334:8 substances 18:23 158:15 175:14,17 184:23 185:1,3,4 186:4 191:21 223:24 224:2 299:23 314:13 335:16 substantial 35:22 268:12 269:4 substantive 93:4 96:7 subsumed 46:15	subtle 80:3 subtraction 340:10 sud 101:3 sudden 365:17 sufficient 128:5 129:1 188:4 189:20 197:22 229:12,15,20 306:6 308:1,9 sufficiently 178:22 325:14 suggest 55:2 56:13 128:7 129:3 304:10 suggesting 79:1 250:14 334:24 suggestion 76:19 suite 2:9,21 372:2 sum 350:3 summarizing 64:6 summation 347:5 summed 349:24 superior 372:1 supervision 43:2 81:12 supplement 28:8 supplemental 12:21,24 13:1 supplied 179:20 179:20 suppliers 295:11 supply 68:5,6 69:13 70:17 82:11 82:15 127:16 128:7 131:4,6,8,12 131:14 132:2,8,22 133:17 149:12 150:1,5 152:6,16 152:18 153:17,23 154:7 159:21	160:8,9,12,14,18 166:4,6,7 170:22 171:2,7,8,24 172:5 172:9,15,23 173:9 173:12,18 174:15 179:5 195:18 226:23 227:3,5,9 227:12,16,17,22 230:2 231:24 232:6,20,24 233:1 233:4,19 234:6,10 273:20 294:23 295:1,11,12,24 296:6,20 support 12:6,15 12:16 13:2 355:2 supported 147:13 supporting 123:3 supposedly 108:4 121:9,14 142:11 sur 163:7 sure 34:18 35:1 44:8 50:1 57:19 64:24 87:2,8 92:4 92:4 97:21 112:3 125:12 127:15 133:1 135:19 139:21 140:4 141:20 147:5,16 159:2 166:2 167:5 169:13 173:4 174:14 176:11 177:22 191:18 206:17 208:23 209:5 214:6 220:23,23 235:21 246:21 250:12 259:22 267:7 268:9 292:2 294:20 299:9 304:16 314:20
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[sure - talking]

Page 58

319:6 320:2 323:15 325:17 331:2 332:15 334:19 338:10 341:3 348:1 350:7 352:1 355:16 363:17 surgery 123:1 surmise 71:23 surplus 113:22 114:2,6,9,10,11 121:19 123:11 124:12 surprise 72:24 302:21 303:8 351:2 surprised 301:22 303:21 surprising 54:3 survey 29:23 192:7 surveys 163:7,16 258:12,13 suspect 362:11 suspicious 300:6 swallow 84:15 87:20 swallowing 88:2 swallows 71:5 88:4 swear 10:1 switch 182:7 sword 94:23 sworn 10:2,5 371:7 373:10,13 374:14,18 375:21 symptoms 6:8 34:9 38:23 100:8 100:13 101:3 243:2	synonymous 141:5 synthesis 5:14 21:22 22:6 synthetic 236:7 237:2 314:23 319:18 320:22 322:12,17,18 323:8 324:21,24 325:7,9,11,13 327:8 349:9,10,12 351:21 353:18,18 357:1,6 system 184:21 systematic 5:14 21:22 22:5 229:24 232:14 242:6 systemic 307:3 systems 151:1 t t 10:3 185:5 187:20,21 361:22 t40 356:15 t40.1 334:11,14,16 335:23 336:5,19 338:4 343:23 344:7,9,18,23 345:16,24 346:8 t40.1. 344:19 t40.2 334:7,15 335:16 337:13,19 338:14 339:14,14 342:21 343:2,13 343:19 348:6,14 355:24 t40.2. 338:5 t40.3 334:8,15 335:16 337:13 338:14 339:15 342:21 343:3,13 343:19 348:6,14	356:1 t40.4 334:12,14,16 335:23 336:8,20 337:13 339:14 342:20,21 343:9 343:12 344:4,9,10 344:23 345:17,17 345:22 346:1,6,8,9 346:16 347:7,11 347:21 348:5,6,14 348:21 351:7,21 352:5,8,20 354:7 354:10 355:24 356:1,2,16,20 357:1 361:17,20 362:3 363:10 t40.4. 336:6 339:15 343:3,24 346:22 363:15 tab 339:7,9 table 182:10 201:12,16 213:5 213:11 244:3 253:14 316:17 tables 183:16 339:23 tainted 129:1 take 8:11 13:21 15:18 20:12 22:7 26:23 29:1,6,13 31:17 39:10 42:19 43:15 44:6 51:3,9 53:4 54:4 63:18 64:8 82:22 93:6 93:10 95:1 99:1,2 99:5 102:2,5 106:4 126:19 131:24 132:18 138:4 181:21 185:12 189:18 193:7 204:19	208:4 220:21 222:9 233:8 235:24 238:10,22 239:2 241:3 246:9 258:7 264:17 271:6 287:16 289:24 294:12 299:10 300:19 302:17 311:22 327:1 333:17 347:10 350:4 362:21 363:1 364:13 taken 1:19 8:13 25:11 89:13 99:11 126:9 154:9 166:14 190:1,2 198:3 221:3 238:12,14 271:11 301:23 303:23 304:3,23 369:7 371:6,9,13 takes 181:20 talk 113:19 141:13 160:3 187:5 190:8 191:22 193:6 257:11 272:22 274:1,14 279:13 294:22 369:3 talked 131:7,9 134:19 145:19 170:22 248:4,11 249:4 253:9 288:20 367:23 talking 69:8 70:16 70:17 84:19 93:24 105:14 110:5,6 113:12 127:14 129:16 141:20 146:17 177:23,24 187:14 190:10,11
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[talking - think]

Page 59

193:16 215:8 235:22 241:19 248:20 250:20 271:18 272:23 274:2,11 275:8,10 276:22 280:4,24 293:24 342:7 360:10 talks 49:17 283:23 tally 304:15 target 65:19 targeted 55:21 taught 139:5,8 taylor 3:9 team 17:3,5,6,7 technical 17:13 teenagers 294:12 tell 13:20 55:24 56:4,6 201:24 223:7 292:4 298:7 319:17 357:11 368:24 telling 281:21 ten 52:20 271:7 365:10 370:2 tenth 3:6 teresa 1:20 8:23 57:19 371:4,20 term 27:15 40:11 40:24 41:3 104:9 104:15,20 167:3 314:20 315:17,21 358:6 terminology 167:3 316:14 terms 30:5,15 32:4 35:24 140:19 147:24 194:2 215:12 257:12 323:8 324:17 336:17 338:22	357:17 test 193:2 tested 97:3 355:10 testified 10:5 15:19 95:10 139:10 202:8 304:4 323:16 330:2 335:18 350:20 354:14 testify 339:22 testifying 15:11 17:21 80:4 305:21 308:16 367:10 testimony 15:8,13 53:13,14 54:19 55:4 59:8,11 61:3 63:11 67:2,3 70:23 72:13 90:9 96:20 162:13 276:20 312:4,5 320:16,17 321:9 328:15,21,22 329:4,5,13,14 334:5,23 335:7 338:12 352:22 357:8,14 369:13 369:24 373:6,7 374:6,9,12 testing 98:13 tests 354:8 text 40:9 213:5,6 349:6 350:12 thank 18:13 39:8 39:21 65:23 90:6 97:8 98:19,20,21 101:14 136:7 220:24 223:19 301:7,8 307:14 309:18 369:12,15 369:19,21	thanks 165:6 theft 115:10,24 116:7 theory 358:23 364:15,18 365:17 therapy 104:10,15 104:20 thing 62:16 63:8 64:16 88:5,9 225:24 248:3 249:21 301:18 things 66:1 68:7 69:24 70:16 96:20 144:1 160:24 161:18 176:10 181:19 212:17 267:17 331:14 334:2 346:22 361:24 368:11 think 22:14 23:13 23:16 27:14 29:18 30:15 36:3 40:17 44:14,18 45:1 47:15,17 49:6,7 50:19 53:2,3,11,12 55:8,12,18,19,20 56:3,4,6 57:8 59:17 60:7 62:16 63:15 65:1,14 66:1,10,21 67:9 68:18 69:22 74:3 74:5,14,19,22 75:14,15 77:17 80:15,17,19 81:24 82:1,13 83:22 84:11 86:5,11,17 86:21 88:3,16 90:15 92:11,17,21 92:22 93:2,11 95:7 96:3,12,13,24 97:10,11,12,15	98:5,6,11,16 106:3 107:24 108:5,19 110:1,12 113:3,12 117:18,22,23,24 119:1,20 122:16 125:12,15 126:21 127:12 128:4,15 129:5,15 131:17 132:24 134:3,12 134:15,16,21 136:1,13,23 137:13,20,20 138:1,10,12,13 139:2,6,22 146:12 146:19,22 147:11 148:7 152:15 153:6 157:13 159:24 161:23 167:10 171:8 172:11 187:20 188:8 191:3 192:17 196:3,11 196:12 202:8,11 202:24 204:8,10 204:15 205:2 208:8 211:4,18 212:10,23 214:15 215:12 216:22 217:17,24 222:9 224:10 226:14 227:18 228:15 229:12,15,16,18 236:19 237:7 238:2 240:19,24 244:3 247:1 251:10,22 253:9 255:22 259:11 262:21 263:16 266:24 273:5 274:13 278:1 283:22 285:3
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[think - transition]

Page 60

286:6 288:13 293:5 294:8 295:10 301:5 303:7 306:5,14 307:23 308:7,15 309:23 311:4,15 312:16 321:2 323:16 330:2,17 335:5,7,18 337:6 338:12,12 339:1 345:23 348:10,12 348:15 349:5 350:20 356:15 357:18 366:20 368:11 369:3,19 thinking 41:15 65:12 74:19 115:10 144:2,22 173:2,3 241:10 thinks 43:12 third 43:10 44:4 104:5 173:2 228:22 thirty 372:19 thomas 103:13 thoroughly 23:1 thought 50:3 169:1 183:19 254:13 304:6 311:12 316:12 thousand 88:7 285:17,18 three 2:20 19:20 21:13 30:6,10 59:9 62:12 69:7 93:24 123:2 124:5 137:2 154:13 312:16 315:1,5,13 316:1,2,19 317:4 318:16 320:24 326:18 330:3	threshold 29:6 78:3 95:12 thursday 90:10 tie 199:3 216:2 ties 98:7 tim 3:3 9:10 10:8 14:17 16:3,20 52:19 54:6 57:2 60:8 67:18 70:6 72:20 87:2 281:12 time 9:8 13:15 14:17 15:6 16:3 23:8 36:17 44:4,6 45:4 47:13 51:4 51:11,17 52:23 57:7,23 58:18 63:4 66:3,4,12,13 86:2 91:3 92:12 94:19 99:10,15 111:7 112:9,20,21 128:5 151:18,24 166:13,19 184:23 185:10,12 186:5 188:13 200:3 202:15 209:4 221:2,7 230:20 235:1 238:6 244:16 256:23 267:7 271:10,15 272:4,8,21,23,24 273:5 304:1,22 305:3,23 306:17 306:24 307:6,12 318:3,12,13 320:18 323:4 331:24 332:7,10 338:20 344:2 346:4 365:2,6 369:6,11,13 371:6 times 124:5 161:11 217:15	315:14,22,24 316:2,6,8 320:24 330:14,22 333:6,8 365:10,19 title 366:14,19,20 titled 339:7 367:14 tobacco 256:9 today 10:9 28:14 28:15 44:19 45:2 67:1,2 78:20 142:24 143:5 240:15,16 292:10 292:11 301:22 302:13,15,18 303:13 304:7 308:14 319:9,23 328:7 333:14 334:24 340:18 366:10 368:6,15 369:13 today's 56:1 303:9 369:24 todd 246:19,23 told 76:8 331:2 346:3 361:2,23 tolerance 107:5 top 31:14 40:8 164:15 223:9 242:11 257:17,23 258:23 265:1 269:23 334:21 349:18,19 topic 44:24 57:3 79:14 104:17 110:13 111:10 118:21 134:4 143:15 151:6 170:8 178:17 238:9 240:6 296:9 319:12	topics 70:12 248:2 total 15:24 59:6 169:11 170:22 171:2 172:14,23 173:12 179:5 245:13,14 255:23 314:2 320:20 347:11 349:24 352:7 357:21 370:1 totality 124:21 totally 269:5,5 totals 359:18 touch 43:11 tower 2:16 tradeoffs 305:16 trafficked 112:2 202:2,6 253:17,21 traffickers 174:24 176:20,23 trafficking 166:24 167:2,10,17 168:12,15 169:2 170:6 179:18 294:5,8 trained 308:7 trainings 129:3 traits 165:19 trajectories 200:15 transcribed 373:7 transcript 71:13 71:19 371:10,14 372:12,13 373:5 373:12 374:5,11 374:17 transfer 108:16 111:17 transition 55:20 192:10 205:1 206:6 207:3,10
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[transition - understand]

Page 61

208:1 225:14 226:6 240:12 transitioned 192:13 236:24 transitioning 163:1 230:3 transitions 208:5 239:24 240:4 transparency 331:13 transparent 345:15 trauma 248:10 250:6 treat 126:24 127:1 149:5 361:7,9 treated 40:11,24 41:3 46:2 47:13 47:22 treating 142:8 143:22 treatment 6:4 26:9 26:24 29:23 41:23 47:10 116:18 123:7 142:11 144:7 145:8,14,22 146:4,11,16,21 147:1,3,8,21 148:5 148:17 149:11 209:17 266:8,14 285:1 295:16 297:3,6,11,14,22 trend 74:10 90:13 261:11 264:22 290:7 291:12,20 292:15,22 293:9 293:18 trends 220:2 243:17 260:1 366:9	trial 15:12 61:4 63:11 tried 42:3 56:16 192:5 312:1 trouble 102:18 true 117:15,16,17 185:12 234:12 281:20 346:3 truly 221:24 338:23 trust 230:13,18 truth 88:6 try 50:17 51:21 52:15 65:13 90:18 201:3 246:11 309:22 311:23 357:20 trying 17:4,5 30:4 71:15 87:20,21 110:5 118:7 124:18 136:22 170:20 177:22 197:3 216:2 217:3 235:10 242:14,18 252:7,24 253:3 256:13 286:12 307:16 308:19 310:4,5 314:2,7 321:11 322:22 338:23 340:16 343:18 turn 8:7 22:13 48:8 87:10 121:5 162:2 273:18 284:15 296:24 312:11 326:8 367:7 turned 301:12 twelfth 2:13 twelve 316:24	twenty 152:2 371:15 twice 214:7,10 246:1 248:22 251:14 two 16:8 35:8 46:14,16 62:12 66:1,14 123:23 153:13 154:14 164:4,20 171:6,8 171:22 172:14 176:13 182:3 183:23 215:22 256:18 265:16 270:17 273:5 305:19 317:3 326:21 336:3 341:17 353:1,4 358:24 type 86:3 112:12 112:24 116:9 247:20 309:12 354:5 types 118:2 141:23 177:19 183:2,23 222:12,14 240:22 275:14 277:1 284:8 310:8 324:8 typewriting 371:10 typical 195:24 typically 33:1 195:17,18,21,23 238:24 267:18 272:13 typo 309:23	257:1,15,18 258:19 uh 98:22 212:21 247:19 336:21 ultimately 310:24 unaware 196:5 uncertain 311:24 uncertainty 309:14 310:9 311:6,19 underestimate 259:14 underestimated 280:10,15 underestimates 201:6 underlying 6:10 32:3,6 34:7 47:7,8 47:12 48:3,5 290:6 321:10,21 325:20 332:3 358:22 364:22 understand 12:1 16:7 18:21 19:6 19:11,15 23:14,15 23:22 24:15 34:18 43:17 53:1 55:8 56:11,20 67:21,21 68:13 74:12 75:21 83:10,19 84:4 87:3 93:14 97:11 98:11,12 102:4 115:5 120:2 131:1 132:16 136:14 138:22 147:7 176:4 222:6 235:9 253:3 263:7 266:12 286:12 302:4 303:17,18 305:17 306:15 316:15 326:17
		u	
		u 60:2 u.s. 104:6 220:14 226:18 240:5 255:4,18 256:5,12	

331:5 332:15 333:11 334:2 338:10 347:4,12 347:24 354:15 356:10,22,24 357:1 363:16 understanding 6:19 16:12,13 18:21 30:3 42:5 42:16 77:18 80:5 97:22 104:13 110:2 116:21 117:13 118:10 120:20,22 136:9 136:15,20 143:4 143:16 145:6,11 146:9 147:20 148:1 149:4,24 150:4 162:8 163:20 164:10 167:14 168:7,11 170:9 196:9,11 202:19 210:20 213:23 219:9,17 219:21 222:18,20 224:5 225:18 226:12 229:10 236:14,18 237:9 238:24 239:11 243:17 257:2,24 268:7 276:15 277:4 280:13 282:18 283:15,16 284:24 290:23 295:14,23 296:4 296:10,17 315:3 340:7 351:4 358:3 understated 280:1 283:17 understood 75:22 76:18 302:1 350:7	undertaken 20:21 25:20,24 125:20 126:6,10 143:21 144:8,14 undertaking 118:11 196:17 undertook 302:5 303:19 unfair 339:19 unique 66:16,19 67:10,15 83:12 90:12 161:19 unit 8:12 51:16 99:13 151:22 166:17 221:5 271:13 305:1 307:10 369:9 united 1:1 5:6,21 6:21 8:17 42:7,18 131:18 135:1,7 210:8,15 245:21 258:14 units 370:2 unknown 40:11 unlawfully 170:14 unnecessary 159:7 unquote 309:3 310:6 unreasonably 22:23 52:11 59:1 61:7,12 65:6 unreliable 305:13 349:23 unstable 321:6,10 321:13,17 unused 123:1,6 unusual 157:4 upcoming 61:5 updated 183:10 269:20	upper 217:16 upwards 248:15 256:6 urban 6:19 42:5 42:16 81:2,17 86:12,18 155:9 156:11 use 5:16,18,19,21 5:21 6:2,7,8,20 7:2,3 12:12 26:1 26:24 27:5,7,10,12 27:15,16,23 28:14 28:15 29:17,21 31:9,10,12 32:19 32:24 33:4 34:10 34:13,24 35:4,15 35:19,23 36:2,22 37:1,4,12,19,22 38:1,5,9,23 42:7 42:17 46:5,7,24 53:6 55:4 61:22 66:4,5 70:18 78:17 85:13 94:6 94:8,19,21 100:6,7 100:11,12,23 101:1 105:10,13 105:22 106:5,8,15 106:16,18,19,22 107:1,4,16,21 108:2 109:1,2 116:24 118:3 119:2 126:22 131:2 133:16 146:15 148:5,16 159:15,18 160:7 160:19 163:8,9,18 163:20,23 164:3,5 164:17,19 167:21 169:22,22 176:9 180:23 181:4,7,11 187:10 192:7	196:5 198:9 199:6 199:10,22 200:7,8 200:14 201:6,17 201:19 202:24 203:6,9 204:4 205:7,8,12,12 206:7,7,21 208:5 209:7,14 210:7,8 210:14,15 211:20 211:21 212:6,11 212:12 213:20 214:19,21 215:7 215:11,12,13,15 215:19,19 217:9 217:11 218:1,2,6 218:11,18 219:2,3 219:17 220:17 221:11,12 223:5 224:14,15,22,22 225:12,13,15 226:3,4,4,6,15,21 226:24 227:11,14 228:8,18,18 229:1 229:5 230:3,4,11 230:11 231:7 232:7,12,16 233:5 234:2,7,14,17,20 234:22 235:6 236:21,24 239:5 240:21,21,22 241:11,23 242:12 242:12,17 243:2 243:10,11,11 244:11,19,24 245:10 248:11 249:24,24 250:15 250:23 251:3,22 251:24 252:8,18 252:22 253:16,21 253:23,24 254:4,5 254:9,23 255:3,5
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

255:11,19,21 256:3,3,8,15 257:2 257:12,15,19 258:1,15,17 259:9 265:4,11,14,23 266:8 267:14,16 267:20 268:1,8,16 268:22 269:9 270:2,19,20 271:3 271:23 272:9 273:1 280:1,10,15 286:14,15 287:1 288:17 289:6,7,21 289:22 290:7,17 291:6,13,20 292:13,16,22 293:10,19 295:15 308:4 309:9,15 314:8 315:21,24 316:1 320:18 321:3,11 324:19 327:9 332:6 334:23 336:23 343:19 358:6,9,11 358:11 366:1 user 196:1 users 7:4 107:8 123:16 192:8 195:21 196:5,6,7 196:10,14 199:9 199:12,15,16,22 214:14,15 215:16 215:17 226:1 254:18,18 285:10 285:16,17,20,21 286:3,9,10,18,20 286:22,22,23 287:3,6,13 289:8 289:23 293:2 uses 26:19,20 27:18 45:21 108:4	113:23 121:9,10 121:15 125:13,13 127:13 129:13,16 204:6 233:17 270:19 usually 185:8 189:24 358:12 v v 60:1 107:3,7 372:6 373:3 374:3 vague 101:19 149:8 277:10 331:17 346:20 359:12 validating 366:3 validity 88:20 93:9 183:2 324:17 value 275:1 van 283:22 variable 262:20 variables 92:14 93:12 358:24 various 91:6 92:13 247:3,3,4 253:10 325:11 328:19 329:1 334:22 337:7 339:9 vary 210:23 vast 62:10 66:17 84:24 179:16,22 180:4,11 202:19 203:2 venn 35:3 venues 293:15 verified 365:23 veritext 8:22,24 370:3 372:1,8 375:1 veritext.com. 372:17	versus 8:15 155:11 170:14 171:11 172:19 173:9 200:11 270:19,20 320:2 324:12 337:13,13 344:23 345:4 352:21 354:1,2 356:3 video 8:2,10,12 9:12,23 51:10,15 57:18,19,24 99:9 99:13 151:17,22 166:12,17 221:1,5 271:9,13 301:11 301:12,13,15 304:16,21 305:1 307:5,10 369:5,9 369:22 videoconference 1:19 videographer 3:9 8:23 304:14 videotaped 1:19 view 70:21 77:1 78:6,7,11,12 79:7 79:13 80:11 87:10 87:13,14 100:1 101:18,23 108:24 133:15 155:23 228:8 249:19 285:24 301:20 303:17 342:9 view's 79:23 viewed 61:16 77:1 views 71:1 87:5 virginia 1:1 2:16 8:18 15:21 17:10 17:21,23 18:5,22 23:10,12 24:1 49:14 52:16 53:20 55:11,21 60:11,15	60:17,20,23 61:4 61:22,24 64:10,13 64:20 65:18 67:7 68:3,6,10,17,20,21 69:5,10,18,20,21 70:15,17,19,24 71:13 72:4 73:1,8 74:21 75:5,10 76:8,21,23 78:4,8 78:12 79:4,8,11,16 80:8 81:11,16 82:4,6,17 83:1 84:18,22 85:6,16 85:19 87:7,11,17 87:23 88:22 91:4 91:12 92:14,16,20 93:1,9,12,17,23 94:4,9,12,13,14 95:4,5,12,18,23 96:2,22 97:4,21,23 97:24 98:1 100:1 101:6,17,23 102:1 102:8,11,16,22 103:5 104:15,19 125:6 127:3,6 129:9,14 143:1,5 143:12,17 144:15 144:21,24 145:4,8 145:12,21 148:4 148:16,21 150:2,5 150:10,13,17,23 151:3 152:11 153:3,7 155:23 158:1 161:19 162:3,7,14 163:1 164:6,8,18,21 165:8,14,22 166:3 170:15 182:9 183:6 206:6,9,10 206:12,14 207:14 207:19,20,24
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

210:21 211:1,4 212:9,13 213:24 213:24 215:21 216:3,8,19 217:2,4 217:6,10 219:10 219:19 220:1,9,18 222:7,19 224:6 225:19 226:11,15 226:21 227:3,7,10 227:22 228:2,5,9 228:13 229:10 231:11,13 232:1 232:12 233:6,13 233:24 234:19 235:11,15 236:20 240:1 244:11 245:19 246:2,16 249:15 259:13 260:1 262:18 263:4,6,21 264:3 264:19 265:6,22 281:14 282:6,16 283:3,12,20,23 284:2 285:2,4,7 286:1,17 287:2,13 287:15 288:18,24 290:22 291:7,13 291:21 292:16,23 293:10,19 296:1,7 296:11,18,21 302:1 303:5,14,23 319:8 320:4 328:4 328:12 359:17,20 359:22 360:16,19 361:3 371:1,16 vital 147:13 184:20 291:16 volkow 5:8 103:13 103:20 volume 124:10 139:14,19 140:6	140:10,16 141:2,3 141:4,7,7,10,13,15 141:16,17,19,20 141:24 142:22,23 143:1 166:22 volumes 120:3 voluntary 137:4,9 137:9 vowles 5:14 21:23 22:3,24 23:24 24:18 25:3,8,12,17 25:22 26:8,11,17 29:7,16 31:7,13 32:1,4,4 33:14,21 34:8,11 35:9 37:20 38:11 47:11 47:18,19 54:12,22 60:1 93:23 vs 1:6,13 vulnerability 165:18 232:19,23 233:9,10,12,22 vulnerable 227:14 232:16 w w 60:1 wait 57:14,16 163:12 348:10 waiting 33:18 52:11 waived 372:20 walk 119:24 walking 253:12 want 16:4,4 17:2 22:17 25:14 40:21 44:6 45:13,20 49:23 50:1,22 51:9,23 52:10 53:18 57:13 62:16 72:22 81:24 84:4 84:14 87:8,12	88:14,15 93:6 94:20 95:3,4,4 96:7 97:9 103:3 113:13 121:17 132:15 139:21 161:16 169:12 171:16 174:8 220:21 257:10 258:20 287:22 290:20,20 301:18 302:6 303:11,20 307:2 309:3 310:6 317:10 325:10 333:7,22 334:1 338:10 344:13 347:23 356:11 361:9 366:14 369:3 wanted 14:22 15:7 16:16 17:17 29:2 30:2 68:13 104:3 104:5 105:12 107:11 112:7 113:11,20 121:6 121:18 129:17 146:24 155:11 158:24 163:4 174:4,19 182:8 183:22 187:12 201:1 213:16 218:24 223:20 235:9 238:19 258:23 259:24 269:7 278:17 290:4,13 298:2 309:20 331:7 339:20 350:6 356:16 wants 66:4 92:13 warehouse 112:21	warranted 116:17 117:1,12 118:13 137:12 washington 2:13 3:6 way 35:2 46:14,16 47:9,15,17 52:14 75:2,3 77:2 94:19 94:21 97:15 102:9 102:21 104:18,24 105:19 108:11,21 108:23 113:5 114:18 115:2,17 115:21,23,24 116:2 119:23 132:18 133:2,9,23 134:5,9,13,17 143:16 150:8 158:18,19 164:11 169:12 171:15 177:15,17 178:3 186:16 202:12 203:22 241:23 242:6 253:1,8,11 255:9 259:16 268:14 272:15,15 273:6 294:24 296:10 311:7 312:17 315:20,24 315:24 316:11 319:23 328:17 332:4,11,12 337:24 338:24 339:1 344:1 348:15,18 350:21 351:20 356:6 357:15 362:13 ways 67:1 114:24 115:8,13 116:4 119:22 120:1 132:15,21 133:1,6
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

133:13 141:23 182:4 253:10,13 323:12 331:12 350:22 352:2 354:4 357:16 362:14 365:13 we've 12:23,23 50:9 57:18 59:8 66:11 88:3 98:17 99:4 129:6 131:7 131:9 133:7 134:21 145:19 196:16 197:11 217:5 220:20 222:23 249:4 253:9 263:13 264:7 288:19 292:9,11 304:17 305:8 360:10 web 327:24 weeks 104:10 weighed 138:7 weighted 349:21 350:10 went 172:2 318:17 355:20 364:16 west 1:1 8:18 15:20 17:10,21,23 18:4,22 23:10,12 24:1 49:14 52:16 53:20 55:11,21 60:11,15,16,20,23 61:4,21,24 64:10 64:13,20 65:18 67:7 68:3,6,10,17 68:20,21 69:4,10 69:18,20,21 70:15 70:17,19,24 71:13 72:4 73:1,8 74:21 75:1,5,10 76:8,21 76:23 78:4,8,11	79:3,8,11,16 80:8 81:11,16 82:4,6,17 83:1 84:18,22 85:6,16,19 87:6,10 87:16,23 88:22 91:4,12 92:14,15 92:20 93:1,9,12,17 93:22 94:3,9,12,13 94:14 95:3,5,12,18 95:22 96:2,22 97:4,20,23,24 98:1 100:1 101:6,17,23 102:1,8,11,15,22 103:4 104:15,19 125:6 127:3,6 129:9,14 143:1,5 143:12,17 144:15 144:21,24 145:3,8 145:12,21 148:4 148:15,21 150:2,5 150:10,13,16,23 151:3 152:11 153:3,7 155:22 157:24 161:19 162:3,7,14 163:1 164:5,8,17,21 165:8,14,22 166:3 170:15 182:9 183:6 206:6,9,10 206:12,14 207:14 207:19,20,24 210:21 211:1,4 212:9,13 213:23 213:24 215:21 216:3,8,19 217:2,4 217:6,10 219:9,19 220:1,9,18 222:7 222:19 224:6 225:19 226:11,15 226:21 227:3,7,9 227:22 228:1,4,9	228:12 229:9 231:10,12 232:1 232:11 233:6,13 233:24 234:19 235:11,15 236:20 239:24 244:11 245:19 246:2,15 249:15 259:13 260:1 262:18 263:4,6,21 264:3 264:19 265:6,22 281:14 282:6,16 283:3,12,20,23 284:2 285:1,4,7 286:1,17 287:1,13 287:15 288:18,24 290:22 291:7,13 291:21 292:16,23 293:10,19 296:1,7 296:11,17,20 302:1 303:5,14,23 319:8 320:4 328:4 328:12 359:17,20 359:22 360:16,19 361:3 371:1,15 whatsoever 75:15 whispering 8:5 who've 253:20 wide 19:7 109:12 138:17 240:20 248:2 widely 107:23 146:20 widespread 107:17 108:2 121:7 146:13,15 wilkes 43:11 50:18 50:21 51:2 52:5 55:1 56:13,18 57:5,15,17,21 58:2 58:4,5,6 60:8	62:15 64:2,24 65:20,24 68:15 71:18 72:17 74:5 77:4,15,17 78:10 79:21 83:7 86:9 87:24 90:11 91:19 92:2,7 94:17 96:24 98:5,22,24 302:5,21 303:18 williams 2:12 9:19 willing 57:2 362:10 wilson 224:20 225:4 window 318:15,15 wit 371:2 withdraw 50:22 withdrawal 107:5 witness 10:1,2,4 14:18 23:2 57:12 59:3,8,22 60:2 63:14,15,21 64:9 65:17 67:24 68:2 69:19 70:8 73:7 73:15 75:6 76:15 77:22 81:7 84:8 84:20,21,23 85:21 88:16 90:8 91:10 92:18,23,24 93:18 94:15 96:8,13 97:18 99:5 101:8 161:8 162:8,22 216:2 277:24 278:4 339:19 341:20 342:5 371:7,10 372:9,12 373:1,4,11 374:1,4 374:15 witnesses 62:20,23 73:21 74:16 77:3
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

[witness' - zoom]

Page 66

witness' 372:15	130:18 132:18	255:12 260:11
wonder 88:7 202:9	153:21 261:21	270:19,24 321:23
306:10 337:9	289:19 371:9	331:9 349:22,22
338:21	wrong 82:21 225:9	349:24,24 350:15
wonderful 88:5	wrote 44:21 54:13	350:16,19,19
word 30:3 93:22	60:3 78:16 230:20	360:22 363:9,18
102:20 162:21,21	287:23	363:22 364:6
177:23 314:19	wv 2:9,17 6:17	365:20
words 18:5,15	13:7 371:20	years 30:24 40:20
73:7 81:24 82:7	x	147:17 178:15
83:9 142:7 177:6	x 75:7 80:12 82:11	213:19 232:2
261:18	85:11 95:17	235:8 244:22,24
work 15:14,24	y	270:16 285:11,20
16:18 17:10,21	y 10:3 75:7 80:12	285:21 320:21
51:20,24 145:9	82:12 85:11 95:22	331:5 351:11
160:14 161:1,3	yea 289:14	360:2 363:12,14
183:19 259:15	yeah 13:13,19	364:17
337:7	17:16 36:11 41:15	yesterday 18:8
workbook 339:4,6	52:21 55:7 57:8	212:17
worked 18:4 340:3	84:6 99:22 101:20	york 2:7 10:13
working 56:22	127:14 134:6	15:20 34:4 43:9
191:8 340:7	163:14 164:12	49:3,11,13 53:8,22
341:22 342:14	170:20 174:10	55:12 59:5 60:13
works 338:6	183:15 187:1	60:19 61:2,17
wow 212:22	194:11 211:2	68:8,12 69:6,10
write 44:18 45:2	216:22 217:19	70:10,22 73:3,8
117:19 118:19	218:8 223:10	75:7 76:11,20
130:23 223:8,17	225:24 237:22	77:11 78:18,21
314:22	238:19 250:12	79:14 87:14 91:12
writes 115:6	255:16 257:6	161:9 178:20
116:22 118:10	258:11 269:12	205:16,23 281:23
119:19 133:4	272:18 276:21	297:20
writing 129:4	287:19 289:14	young 155:14
130:12 134:4	297:15,16 316:11	290:8 291:2
148:8 230:22	318:8 349:7	youth 7:3 289:7,22
written 19:17 22:3	350:11 351:2	z
40:1 42:15 48:19	366:20 369:18	z 75:7 80:12 85:11
56:7 81:8 90:14	year 81:18 211:14	zee 283:22
103:13 104:20	213:1,9 223:23	zoom 8:21 10:10
115:19 119:14	244:15,17,18,20	
127:21,23 128:9		

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

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Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at www.veritext.com.